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AIR PROGRAM POLICY STATEMENT: A STATUS REPORT AND DISCUSSION OF FUTURE PROGRAM CONSIDERATIONS INVOLVED IN IMPLEMENTING THE CLEAN AIR ACT

FIRST EDITION

ENVIRONMENTAL PROTECTION AGENCY

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Air Program Policy Statement

A Status Report and Discussion of Future Program Considerations Involved in Implementing the Clean Air Act

First Edition

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OFFICE OF THE ADMINISTRATOR

SUBJECT: Air Program Policy Statement

FROM: Russell E. Train
Administrator

TO: Regional Administrators

The attached Air Program Policy Statement provides a summary of current EPA policy in implementing the Clean Air Act. The document puts into context the many actions taken to date by EPA and the States in fulfilling the Act's requirements.

This document should facilitate understanding of actions taken to date in implementing the Clean Air Act. You are encouraged to make it available to air pollution control agencies and members of the public.

AIR PROGRAM POLICY STATEMENT

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Preface

This document summarizes key policy considerations involved in the implementation of the Clean Air Act. Its purpose is to foster the understanding of actions taken by EPA in implementing the Clean Air Act. Since the implementation of the Act and the Act itself are subject to change through legislative, judicial, and administrative action, it is planned to update this document regularly as warranted by changes in policy. The updating system is to consist of yearly reissuances of the document, with less extensive updating of policy statements as frequently as warranted.

Amendments to the Clean Air Act for purposes of facilitating actions aimed at alleviating energy shortages, incorporated in the Energy Supply and Environmental Coordination Act of 1974, are not fully treated in this edition of the Air Program Policy Statement. It is expected that the first set of updating revisions will cover policy changes made pursuant to these amendments. Additional, more extensive amendments to the Clean Air Act are being considered by the Congress at this time; final legislative action, however, is not foreseen during 1974.

The discussion which follows should be considered as both a status report, an indication of where we are now and how we got there, and an outline of where we expect to go in the future. It is not intended as a complete statement of the Environmental Protection Agency's air pollution control program; it relates primarily to the operational objectives and programs of the Agency and the requisite companion programs of the States in achieving the Clean Air Act's goals. Thus, the discussion does not cover the Agency's substantial research effort to define health effects, welfare effects, control technology for mobile and stationary sources, or the definition of mechanisms for atmospheric transportation and interaction of pollutants, nor is it an exhaustive compendium of all matters related to air pollution control. Furthermore, the discussion does not deal with alternative future courses of action; the future is dealt with only to the extent that policy is relatively well developed.

Summary Statement of Goals and Priorities for Air Pollution Control

The Clean Air Act, as amended, provides the basis for EPA's Air Program. To date, EPA's efforts in implementing the Act have focused on:

- Developing standards:
  - o National Ambient Air Quality Standards (NAAQS) for protection of health and welfare from the effects of certain pollutants.
  - o New Source Performance Standards (NSPS) for controlling emissions from new or modified stationary sources of air pollutants.
  - o National Emissions Standards for Hazardous Air Pollutant Sources (NESHAPS) for controlling emissions from stationary sources of specially dangerous pollutants.
  - o Standards for new light duty vehicles for controlling their contribution to air pollution.
- Developing State and local air pollution control programs in order that control actions be taken at the most effective governmental level.
- Developing, in cooperation with States, State Implementation Plans for limiting pollutant emissions in order that NAAQS be achieved.
- Implementing new light duty vehicle emissions standards.

Success in carrying out the foregoing activities requires that the thrust of EPA's near-term Air Program priorities be shifted:

- First priority is to obtain compliance with existing emission limits for all sources, i.e., improve air quality by reducing pollutant emissions.
  - o The basic goal is for States to obtain source compliance.
  - o EPA will selectively enforce if States do not act effectively and expeditiously; EPA's enforcement efforts will be coordinated with the States.

- Simultaneously, EPA will continue to carry out programs for:

  - o Strengthening of State/local air pollution control programs. It is an Agency objective to delegate all responsibilities that can be properly carried out by States.

  - o Finalizing incomplete SIPs through State action.

  - o Analyzing SIPs for their impacts on energy supplies in order that energy supply and environmental goals do not unnecessarily conflict.

  - o Finalizing control plans for mobile source-related pollutants in order that implementation actions be facilitated for attainment of oxidant and carbon monoxide NAAQS.

  - o Amending SIPs for the prevention of future environmental problems:

    - -- Prevention of significant deterioration of air quality.

    - -- Maintenance of NAAQS once achieved.

- Programs for which the Federal government has primary responsibility will continue to be carried out. These include new motor vehicles control, standard-setting for stationary sources, and review of the need of control for additional pollutants.

The highlights of EPA's Air Program during the period 1976-1980 are expected to be:

- A continued emphasis on stationary source enforcement.

- Implementation of controls for mobile source-related pollutants will be a major program effort during fiscal 1975, reaching its peak in fiscal 1976.

- Prevention of significant deterioration and maintenance of standards will require the development of land use and transportation patterns that are compatible with desirable air quality.

- New standards will be developed over this period and existing SIP regulations may have to be revised.

AIR PROGRAM POLICY STATEMENT

I. Introduction

A. Legislative Philosophy and Objectives

The Clean Air Act,* in order that air pollution be reduced and prevented, provides for the establishment of a set of environmentally important goals, sets forth the process by which the goals are to be attained, and expresses a philosophy with respect to both the goals and their method of attainment.

The goals are quantified in the National Ambient Air Quality Standards,** which set forth the allowable concentration in air of a set of air pollutants associated with diverse sources widely distributed throughout the nation. A second set of standards impact directly on emitting sources through the establishment of Federal national emission limitations. These standards include National Emission Standards for Hazardous Air Pollutants, National New Source Performance Standards, and nationwide limitations on pollutant emissions from mobile sources.

The philosophy of the Act gives first priority to the achievement of standards protective of health. Where protective of health, the Act established mandatory times for the attainment of the standard. Where protective of welfare, the Act provides for administrative discretion as to the time of attainment of standards.

Several interrelated types of action make up the process by which environmental goals are to be attained. The Act mandates the adoption of regulations setting forth legally enforceable emission reduction plans. It provides for the adoption of certain technologies in the private sector on a nationwide basis; for example, best adequately demonstrated technology in the case of new stationary air pollution sources and a mandated reduction from new light duty motor vehicles. The Act furthermore requires the use of certain controls not traditionally applied for air pollution control, such as the control of land use and transportation, when control technology seems inadequate to meet the environmental goals within the mandatory time schedules set forth in the Act.

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* References to the Clean Air Act (or simply the "Act") in this document imply reference to all its amendments, notable among them being the Clean Air Amendments of 1970 (PL 91-604) and the Air Quality Act of 1967 (PL 90-148). The 1970 amendments specified the mandatory time frames addressed herein.

**Appendix B summarizes these standards.

The philosophy circumscribing the process is as follows:

- The States* are to be given the opportunity to design and implement the plan for achieving the environmental goals.
- The Federal Government must take action when States do not adopt or carry out an adequate plan for achieving the goals.
- Opportunity must be provided for public participation in the development of Federal standards, State plans, and subsequent changes in such standards or plans. Furthermore, information must be made available to the public on State progress in carrying out the plan.

The highest priority for Federal and State action has generally been directed towards those Air Quality Control Regions where pollutant concentrations exceed national standards which are protective of health. After three years of experience with the Act, it has become clear that for some pollutants in some areas the standards protective of health cannot be attained in the mandatory time period with the available control technology. The act provides only limited flexibility in case of such eventuality: Two year extensions of time for a given Air Quality Control Region and one year extensions for compliance of specific sources (or classes of sources) with plan requirements. In the case of pollutants emitted primarily by motor vehicles in some Air Quality Control Regions requiring transportation controls, the level of social and economic change which may be required to meet ambient standards may be unacceptable in terms of economic and social impact.

In the fourth year of implementation of the Act, it is evident that State Implementation Plans (SIPs) can achieve standards protective of health within the mandatory time period in the majority of Air Quality Control Regions. Action to assure that the provisions of the plans are carried out is required in these Regions. For some Regions, control will not be feasible due to circumstances beyond control agencies' control (i.e., natural dust sources) or without unreasonable control measures.

Additionally, two relatively new areas of program concern are to be given increasing priority: One is the broadening of the land-use planning mechanism to assure the future maintenance of standards once achieved and the prevention of significant deterioration of air quality in relatively clean areas; the second is the utilization of flexibility within the Act to assure that environmental goals and goals of energy

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* The Act defines as States the 50 states, the District of Columbia, Puerto Rico, Guam, American Samoa, and the Virgin Islands.

sufficiency do not unnecessarily conflict. Likewise, legislative change will be needed to provide some discretionary flexibility with respect to the attainment of standards under conditions of unreasonable restraint of normal social and economic activity and development.

B. Clear Air Act Amendments

The Act has recently been amended by the Energy Supply and Environmental Coordination Act of 1974, signed into law by the President on June 22, 1974. The amendments to the Act accomodate the need for increased reliance on domestic energy supplies (i.e., coal) and extend authorizations for appropriations for its implementation for an additional year (i.e., FY1975).

The Congress is also considering more far-reaching amendments recommended by EPA and other Federal agencies; these amendments were submitted to the Congress on March 22, 1974 by the EPA Administrator. Extensive hearings on the Act and its impact have been held to date by the Congress. The Congress has also commissioned a study by the National Academy of Sciences into the scientific validity of the Act's assumptions and EPA's implementing actions. The NAS is to report to Congress by September 1974. At this time, it is not known what final Congressional action will be; no action is expected until 1975.

The Energy Supply and Environmental Coordination Act of 1974 provides for the conversion of power plants and other fuel burning facilities to the use of coal. The legislation sets up a series of safeguards to assure that the primary National Ambient Air Quality Standards (protective of health) are achieved and maintained. If the EPA Administrator determines that conversions to coal would lead to the violation of the standards or that the standards are not being achieved in the Air Quality Control Regions in which the sources are located, the conversions can be prevented or appropriate emission controls can be required. The legislation also facilitates the implementation of EPA's Clean Fuels Policy by providing for the review of SIPs and their change, by States, on an expedited schedule. Extensions in meeting the emissions limitations imposed under the SIPs can be granted by the EPA Administrator until January 1,1979 if certain conditions are met by the sources applying for the extensions. At no time can an extension be granted if the Administrator determines that necessary technology for meeting standards is available.

The new legislation provides for extensions of statutory auto emissions standards to 1977 for carbon monoxide and hydrocarbons, sets the standard for 1976 model year the same as for 1975, and provides for a 2.0 grams per mile emission standard for nitrogen oxides for 1977 model year vehicles*. The legislation also requires studies on the health

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* The emission standards for light duty motor vehicles are summarized in Appendix C.

effects of increases in sulfur oxides emissions and a study on automobile fuel economy. The use of parking surcharges for implementation of transportation controls is proscribed, and a study of the need for certain transportation control measures is required.

The amendments proposed by EPA, titled "The Clean Air Act Amendments of 1974," would provide authorities for granting variances from emissions limitations during 1974; facilitate the conversion of power plants to the burning of coal (consistent with meeting primary ambient air quality standards); provide for the review of the SIPs in order that best use be made of scarce clean fuel supplies for meeting primary standards; provide for the granting of extensions in NAAQS achievement dates for those AQCRs in which unreasonable (i.e., having serious adverse social or economic impacts) control measures would be required to meet NAAQS within the current deadlines; provide for the setting of equipment standards for the control of sources for which it is not feasible to set a hazardous or performance emission standard; authorize waivers of compliance with new source performance standards to encourage innovative control approaches; authorize civil penalties of up to $25,000 per day of violation to facilitate enforcement activities; authorize enforcement orders for stationary sources with final compliance dates beyond attainment dates for the NAAQS to facilitate the installation of control equipment; and would extend the Federal auto emission standards applicable to the 1975 model year for CO and HC through the 1976 and 1977 model years.

The amendments suggested by other Federal agencies would allow the indefinite use of intermittent control systems and would eliminate the need to provide for the prevention of significant deterioration of air quality.

II. State Implementation Plans: The Planning Process

A. Introduction

The Clean Air Act's provision for the setting of National Ambient Air Quality Standards (NAAQS) for pollutants for which criteria have been issued triggers the planning and action process requirements of Section 110 of the Act. The development of control strategies by the States for the achievement of the NAAQS constitutes the essence of the planning process. This part of the paper examines the history, policy implications, and nature of future action requirements of the planning process. (The execution of the plans is covered under Part III.) This part concentrates on the future, with an examination of past actions for the purpose of clarifying the context in which future planning activity must be carried out.

The State Implementation Plans (SIPs), as documents, set forth the control strategies that will be followed by a State (within given timeframes), for achievement of NAAQS within specified geographic areas, i.e., Air Quality Control Regions (AQCR). The Act places primary responsibilities for air pollution control on the States. The SIPs specify the plan of action for achieving the Act's objectives, i.e., reduction in emissions levels requisite for meeting NAAQS and the prevention of excessive increases in emissions in the future in order that NAAQS be maintained and that significant deterioration of air quality be prevented.

As a planning process, the SIPs are dynamic. Constant review and improvements of the plans are a part of this process. The Act includes important features for reviewing, updating, and changing of plans for the purpose of accommodating changing requirements, be they social conditions, growth patterns, or the changing status of technology, while preserving the Act's essential thrusts, i.e., the achievement of air quality levels consistent with protection of public health and welfare within realistic timeframes and the preservation of the nation's air resources.

The SIP process is examined below in relation to the degree of success that has been achieved in developing adequate plans for the various pollutants that require control and assesses the need for future planning action. Transportation controls, maintenance of standards, and prevention of significant deterioration of air quality requirements of the Act have been selected for extensive treatment due to their land use control implications and concomitant controversiality. Future implementation of the planning process envisoned by the Act will have to concentrate on land use decisions; for the foreseeable future, technological solutions to air pollution problems will not suffice for achievement and maintenance of the Act's goals in many parts of the nation.

B. Historical Perspectives: The Clean Air Act's Planning Process Implementation to Date

1. Summary of Events

The promulgation of National Ambient Air Quality Standards on April 30, 1971, for six pollutants set in motion the Act's planning and plan execution process for achieving the NAAQS by 1975. EPA provided guidance to the States as to the analytical and procedural requirements that States had to meet in order that the planning process comply with the criteria set by the Act.* By the end of January 1972 all States had submitted SIPs to EPA; on May 31, 1972, EPA totally approved 14 SIPs, with the remainder being in various degrees of non-compliance with the criteria set up by the Act. By June 1972, EPA had started the process of formally (i.e., by regulatory action) correcting deficient State plans. The timing of actions was within the timeframes established by the Act.

Consistent with the philosophy of the Act, EPA encourages States to submit their own regulations as replacements for the ones proposed or promulgated by EPA. Thus EPA assures that States have the primary responsibility for carrying out air pollution control programs, but EPA does take corrective action in cases in which the States cannot or do not act in time to meet the requirements of the Act. This policy has resulted in a minimization of Federal promulgation and maximum participation by States in the implementation of the Act.

To complete State Implementation Plans, EPA proposed and promulgated regulations for the public availability of data in 12 States; source recordkeeping and reporting in 9 States; and the review of new sources and modifications in 11 States. The Act requires that SIPs cover these functions, which are essential for adequate air pollution control. The emission limitations necessary to correct the deficiencies in several States are in various states of development, proposal and public comments, and promulgation.

In some cases, however, EPA has found it impossible to compy with the Act within given timeframes and its interpretation of the Act's requirements have not always been substantiated by tests in the courts. These legal tests have resulted in significant plan change actions. This plan refinement process is still being carried out; prospective

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* This guidance was initially promulgated in the Federal Register on August 14, 1971. Since then, the guidance has been amended substantially. A listing of significant amendments is provided in Appendix D.

amendments to the Act will intensify the process of plan refinements. To the extent possible, consistent with the requirements of the Act, it is EPA's policy to minimize the number and scope of plan revisions in order to minimize problems associated in implementing constantly changing requirements.

Each significant refinement in the planning process has been coupled with a better definition of the procedural and/or analytical requirements. These changes have been documented by EPA in amendments (adopted after opportunity for public comment) to the original August 14, 1971, guidelines for SIP preparation.

Since the time of plan approval, a number of issues have been identified and attention has been focused on them as a result of court decisions involving interpretation of the Act. These court decisions, by interpreting some of the Act's requirements differently from EPA's interpretation (e.g., on extensions of compliance dates), have affected the approvability of some State plans and have resulted in EPA disapproval of portions of previously approved plans. A few significant cases are reviewed below.

2. Legal Interpretations of the Act's requirements

a. Transportation Controls

On January 31, 1973, the Court of Appeals for the District of Columbia Circuit ordered EPA (pursuant to a suit brought by the Natural Resources Defense Council and seven other related cases) to rescind the extensions in time granted by EPA for the submissions of transportation and/or land use control portions of the SIPs. The court order held that the Clean Air Act did not permit the delay in submission of these portions of the SIPs until February 15, 1973, or permit the granting of extensions to mid-1977 for attainment of the primary NAAQS where plans had not been submitted. EPA had granted these delays at the time of initial plans submission. In compliance with the court order, EPA has approved plans submitted by the States or has promulgated substitute plans where deficiencies were found.

b. Prevention of Significant Deterioration of Air Quality

On May 30, 1972, as the result of a suit filed by the Sierra Club, EPA was ordered by the District Court of the District of Columbia to disapprove all SIPs which do not "prevent significant deterioration of air quality" in currently clean areas and to promulgate new regulations which would prevent significant deterioration. (The District Court order was subsequently affirmed on appeal by the Court of Appeals and the Supreme Court.) As a result, all SIPs were disapproved on November 9, 1972, to the extent that they did not explicitly "prevent significant

deterioration." For the purpose of soliciting public comments, alternative sets of regulations were proposed in the Federal Register of July 16, 1973. On August 16, 1974, regulations for implementing the prevention of significant deterioration provisions of the Act were proposed.

c. Maintenance of Standards and New Source Review (Indirect Sources)

Pursuant to another court order of January 31, 1973, in Natural Resources Defense Council vs. Ruckelshaus, EPA has proposed and promulgated regulations requiring that SIPs include procedures to prevent construction of "indirect sources" which would interfere with attainment and maintenance of the National Ambient Air Quality Standards as well as for the revision of SIPs for the maintenance of standards once achieved.

The term "indirect sources" describes facilities which indirectly cause air pollution by substantially increasing traffic and resulting vehicular-related air pollution, e.g., shopping centers and sports arenas. Most States have not submitted approvable plans; EPA promulgated indirect source control parts of SIPs on February 25, 1974, for all deficient plans. However, in keeping with EPA policy, all States are encouraged to implement EPA's or their own plans where developed to replace EPA's promulgations.

The maintenance of standards on a regional basis is to be achieved by the development and implementation of air quality maintenance plans for specific air quality maintenance areas (AQMAs). AQMAs have been proposed, with final designation expected by the fall of 1974. Maintenance plans are to be developed by June 1975.

d. Source Compliance Issues

Another set of issues related to SIPs involves regulations related to sources' alleged inability to achieve requisite emission reductions. The ultimate solution to these types of problems, if no technological solutions become available, resides in land use limitations. The legislation does envision the reduction or discontinuation of activities (in extreme cases, leading to plant closures) in cases that no alternative exists for meeting emissions reductions.

On May 31, 1972, EPA disapproved SIPs for Arizona, New Mexico, Nevada, Utah, Idaho, and Montana. These States did not submit adequate plans to control sulfur dioxide from copper smelters. Regulations for control of these sources were proposed by EPA and public hearings on the regulations were held during August, September, and October of 1972, at which time substantial comments were received. Numerous court suits have been filed by the individual copper smelters against the proposed

regulations. Involved in these challenges to the SIPs is the utilization of Supplementary Control Systems (SCS). EPA and the States are in process of finalizing control requirements.

The courts have also found that the State of Georgia's SIP, allowing the use of tall stacks for air pollution control, was not in conformity with the Act's requirements. This SIP would have allowed sources to raise the height of stacks, thus dispersing pollutants rather than eliminating them, as a means of meeting air quality standards. The Court found that constant emission limitations, rather than pollution dispersion, were required by the Act where such constant emission limitations are available. Fourteen other States may also have tall stack regulations similar to those in Georgia which will require a revision to this portion of their control strategy.

e. Procedural Issues

As a result of court decisions by the Third, Fourth, and Sixth Circuit Courts of Appeals, EPA has modified the procedures for dealing with regulatory plan revisions and supplemental information. These court decisions required EPA to comment on the "reasonableness" of a State's plan prior to publishing the approval/disapproval decision. To implement this requirement, the public is notified by a notice of proposed rulemaking (published in the Federal Register) which provides the opportunity to comment on all plan revisions which are regulatory in nature. The opportunity for public comment will allow the Agency to incorporate all points of view into its regulatory decisions and to better judge the "reasonableness" of any control measure proposed.

3. Other Issues Affecting SIPs

At the time of initial SIP approvals, 47 AQCRs were classified Priority I for NO_2 (i.e., exceeding standards and requiring specific control measures for achieving the NAAQS). Deficiencies discovered later in the air measurement method used for determining the air quality levels used for classification led to a June 8, 1973 proposal of reclassifying most of the affected AQCRs as priority III (requiring no specific NO_2 control strategies). On May 8, 1974, reclassification action was taken, with only Los Angeles and Chicago requiring control strategies for NO_2. The New Jersey-New York-Connecticut, Wasatch Front (Salt Lake City), and Baltimore AQCRs retain Priority I status, with final classification action dependent on additional air quality data that would allow a definitive assessment of the NO_2 air quality levels for these AQCRs.

Another significant land use issue relates to the control of wind blown dust. On May 31, 1972, EPA disapproved the Nevada, California, Arizona, and New Mexico SIPs for the control of particulate matter. These States failed to demonstrate attainability of both primary and secondary standards for particulate matter in their SIPs. The major

reason for disapproving these plans was the inadequacy of the proposed strategies to control particulate matter from wind blown fugitive dust from farming, construction, and areas bereft of natural vegetation. The SIPs of several other Western States, i.e., Kansas, Colorado, Nebraska, Iowa, Oklahoma and Texas, are being evaluated for this same problem.

C. Transportation Controls

1. Introduction

Motor vehicle related pollutants (i.e., hydrocarbons and carbon monoxide) must be controlled in many AQCRs by means in addition to the Federal new motor vehicle emissions standards if the National Ambient Air Quality Standards are to be met within the deadlines set by the Clean Air Act, i.e., 1976-1977, or, in many cases, even at any time beyond the statutory dates. These additional measures have been collectively called "transportation controls" because they affect pollutants generally associated with transportation sources, although stationary sources of these pollutants are also covered.

Initially, EPA granted two year extensions (i.e., to 1977) in all areas where such controls would be required. However, the courts concluded that EPA was not in compliance with the Act by not considering the application of all possible control measures, including transportation controls and land-use controls, before granting extensions in NAAQS achievement dates. Based on these court decisions, EPA had to reevaluate its approval actions, require States to impose or consider additional controls, and promulgate such controls in cases in which States could not act within the strict deadlines set by the courts.

Control of excessive vehicular emissions in the affected AQCRs has been approached in two broad categories of actions: Reductions in emissions from individual vehicles beyond those achieved by the Federal (or California, for this State) standards for new vehicles applicable to the specific model year, and reductions in total motor vehicle emissions by reducing the use, or vehicle miles traveled (VMT), of all vehicles.

Currently, 27 AQCRs are affected by the need to impose transportation controls in addition to stationary source controls and the Federal motor vehicle emission standards. Table I lists these AQCRs. In Birmingham and Mobile (Alabama), Kansas City (Kansas and Missouri), Dayton and Toledo (Ohio), and El Paso and Austin-Waco (Texas), it was determined that additional stationary source control, combined with the Federal Motor Vehicle Control Program (FMVCP), would be adequate

TABLE I

Air Quality Control Regions Requiring Transportation Control Measures for NAAQS Achievement*

State	City/Area
Alaska	Fairbanks
Arizona	Phoenix and Tucson
California	Fresno, Los Angeles, Sacramento, San Diego, and San Francisco
Colorado	Denver
District of Columbia	Washington Metropolitan Area
Indiana	Indianapolis
Illinois	Chicago
Maryland	Baltimore and Washington Metropolitan Area
Massachusetts	Boston and Springfield
Minnesota	Minneapolis
New Jersey	New York City Metropolitan Area (Newark) and Philadelphia Metropolitan Area (Camden-Trenton)
New York	New York City and Rochester
Ohio	Cincinnati
Oregon	Portland
Pennsylvania	Philadelphia and Pittsburgh
Texas	Dallas, Ft. Worth, Galveston, Huston, and San Antonio
Utah	Salt Lake City

TABLE I (continued)

State	City/Area
Virginia	Washington Metropolitan Area
Washington	Seattle and Spokane

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*Only major cities in the AQCR are listed; controls are generally applicable to the AQCR as a whole.

to attain the NAAQS. In addition, the city of Indio, California, will achieve NAAQS if the transportation control plan for Los Angeles is implemented.

VMT reduction measures, in general, require changes in established patterns with respect to use of privately owned passenger cars; technological approaches to reductions in emissions from individual vehicles require no changes in vehicle use, although they may impose financial hardships on individuals. Examples of these measures are given in Table II. Stationary source controls applied as part of transportation control plans include control of the use of organic solvents in paint thinners, dry cleaning operations, and recovery of gasoline vapors at gas stations; these controls can help reduce the nonvehicular hydrocarbon emissions, but do not affect the emissions of carbon monoxide.

Under the law and the ruling of the courts, EPA is required to approve or promulgate whatever mix of controls is required to achieve ambient standards. It is EPA policy to facilitate the application of these measures by approving State developed measures and by taking into account local conditions in determining the reasonableness of the application of control measures. EPA has also indicated to the Congress that certain provisions of the Act, specially in relation to NAAQS achievement dates, should be amended to preclude the need for imposition of unreasonable means of control, i.e., those that would cause serious social or economic disruption.

Detailed explanations as to the justification for transportation control plans, legal authority, control measures, and other pertinent factors may be found in the November 6, 1973, Federal Register, pp. 30626-30633 (38 FR 30626 et seq.). This section of the paper explains the reasons for requiring certain control measures, the relationships between various controls required for the achievement of NAAQS for automotive related pollutants (i.e., CO, HC and NO_x), and the applicability of control measures to specific AQCRs.

2. Transportation Control Measures

a. Relationship of New Motor Vehicle Controls to Transportation Control Requirements

The Federal Motor Vehicle Control Program (FMVCP) provides for a cumulative improvement in ambient air quality (all other factors being equal) as vehicles covered by increasingly stringent standards are introduced and replace higher emitting cars. This turnover requires about ten years. Thus, the statutorily mandated reductions in CO and HC emissions for 1975 impact only minimally

TABLE II

Control Measures for Reductions in Total Motor Vehicle Pollutant Emissions

A. VMT Reduction Measures:[a/]

Parking restrictions, on- and off-streets
Vehicle free zones
Selective vehicle use prohibitions[b/]
Gasoline supply limitations[c/]
Charges for parking or roadway use

B. Alternative Means of Travel:

Exclusive bus/carpool lanes
Bus/carpool matching
Mass transit improvements
Bikeways

C. Other Controls:

Traffic-flow improvements[d/]
Heavy-duty vehicle use restrictions

Emission Reduction Measures Applicable to Individual Motor Vehicles

A. Inspection and Maintenance:

Mandatory maintenance
Emission testing, either loaded or idle mode, followed by maintnenace for failing vehicles.

B. Retrofits:

Vacuum Spark Advance Disconnect (VSAD) with idle
Air bleed to the intake system
Oxidation catalysts

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a/ These measures are intended to shift ridership for work trips from private automobiles with low average occupancy rates (2 persons per car) to mass transit and to private automobiles with a greater average

Table II (continued)

occupancy rate, or to obviate the need for the use of the automobile at all. The reductions in automobile use, as well as the resulting decongestion of roadways, will lead to reductions in pollutant emissions for both CO and HC. The actual extent of the reductions in emissions will vary from area to area, depending on local conditions and the actual applicability of the measures.

b/ This measure has been considered, but has not been used due to the impracticality of implementation.

c/ Measure applied to comply with the letter of the law, but not considered a reasonable control measure by EPA.

d/ Improvements in traffic flow will result in reduction in pollutant emissions due to less idling of engines and less acceleration-deceleration. However, these measures also tend to attract additional traffic.

on the ability to meet ambient air quality objectives by the 1975-77 achievement dates.

Changes in the emission standards for new vehicles will lead to changes in the dates by which AQCRs will be able to meet NAAQS and/or the need for the imposition of additional transportation control measures for NAAQS achievement. NAAQS cannot be achieved in some AQCRs with currently implementable new vehicle control strategies. Therefore, some means of lowering VMT below current levels will have to be in effect in these AQCRs indefinitely. However, it is also clear that the FMVCP will have a significant impact on the achievement and maintenance of the NAAQS in most areas of the country. More stringent controls for heavy duty and medium duty vehicles, and controls for motorcycles are being developed to assure the maximum feasible control of these sources.

b. Achievement of Full Compliance with Emission Standards of Vehicles in Actual Use -- Motor Vehicle Inspection

The implementation of provisions of the Clean Air Act applicable to in-use vehicle compliance with emission standards and State inspection requirements is treated in Part IV of this paper. The Act intends the manufacture of vehicles capable of meeting emissions standards throughout their useful lives. The greatest burden of compliance is placed on vehicle manufacturers rather than individual owners.

The owners, however, must provide proper maintenance of the engine and control devices if the vehicles' emissions are to continue to meet design criteria. The inspection of in-use vehicles' emissions performance or hardware integrity will assure that owners perform the requisite maintenance and refrain from rendering inoperative the emissions control systems installed by manufacturers. The performance of routine maintenance and restraining from tampering with emission control devices will result in improved fuel economy and emissions performance.

Funding of State inspection programs by EPA is not contemplated under current budgets. These programs can be fully funded through inspection fees, in a fashion similar to safety inspection programs; some jurisdictions (e.g., Chicago) have already implemented such funding schemes. Additional information on inspection programs' characteristics and emissions reductions achievable are documented in 40 CFR 51, Appendix N.

c. Emissions Reductions by Retrofitting

The updating of emission controls on existing motor vehicles by the incorporation of equipment or modifications not provided at the time of manufacture is called retrofitting. In prototype tests,

retrofits have been found to reduce emissions by as much as 68% for HC, 63% for CO, and 48% for NO_x for uncontrolled cars. Reductions of 50% for HC and CO, and 40% for NO_x, are achievable for some controlled vehicles with the installation of catalysts and exhaust gas recirculation systems. In California, retrofits are being installed in the field.

However, the full potential of these measures has not been completely documented for all classes of vehicles. In some cases, retrofit technology will not be adaptable to all older vehicles, e.g., catalysts may not be feasible due to physical limitations and gasoline octane requirements of older engines. Retrofitting of medium and heavy duty vehicles, an area of significant emissions reductions potential, has not been adequately assessed. If evaluations currently underway confirm potential benefits, retrofitting of these vehicles may also be required.

d. VMT Reductions

In several urban areas a shift from our present reliance on automobiles occupied by one or two persons to a greater reliance on other forms of transit is essential to the achievement of the air quality standards. Significant reductions in vehicle miles traveled and pollutant emissions can be accomplished within a limited time span.

EPA recognizes that the States have had practically no experience with transportation control measures as a means of dealing with air quality problems and that the success of particular VMT reduction measures is difficult to predict. However, recent developments involving bus lanes, mass transit improvements, carpool programs, bikeways, and other innovations indicate that many VMT reduction measures are available and feasible. Examples would be the Shirley Highway exclusive bus lanes and extensive bikeways in the Washington, D.C. metropolitan area. Furthermore, the public in many urban areas recognizes the need to place less emphasis on the automobile for urban mobility and is already encouraging the implementation of steps to develop alternative forms of transit.

Reasonable VMT reduction measures can be successfully implemented. For example, Los Angeles has set a goal of achieving a 25% VMT reduction by 1977. EPA has promulgated a number of measures designed to both increase the attractiveness of some of these alternative forms of transit and to discourage the low occupancy use of automobiles. The applicability of both measures -- incentives such as bus lanes and disincentives such as parking limitations -- varies according to the conditions in the individual urban area. For example, bus lanes are a more appropriate strategy in Washington, D.C. than certain other areas. Similarly, parking restrictions are more applicable to a major center like Boston than to a small city with few transit alternatives like Fairbanks, Alaska.

The amount of VMT reduction that can be considered "reasonably

available" varies greatly according to an area's individual characteristics and the ability of other modes of transportation to absorb the demand that would be created by a significant VMT reduction. A measure cannot be considered "reasonably available" if putting it into effect would cause severe economic and social disruption. Although some reduction in personal travel could certainly be absorbed without disruption, to achieve a significant VMT reduction the bulk of the travel displaced from single passenger automobiles must be absorbed by other modes of transportation, e.g., carpools, public transit, walking, or bicycling.

Achievement of the levels of VMT reduction provided for in the plans will require a strong commitment by local areas. Some of the plans will have significant effects on the future development of urban transportation in the major cities of this country. A clear implication of these plans is that future augmentation of mass transit must focus not only on the center city but also on the totality of the urban/suburban areas. The need, desirability, and feasibility of reducing urban auto use are not at issue. The problem is to determine the degree of VMT reduction which can be reasonably implemented within limited time-frames.

3. Energy Conservation Benefits of Transportation Control Plans

Several measures included in the transportation plans will lead to significant fuel savings. The reductions in VMT have evident fuel savings consequences. Carpooling and the use of mass transit facilities, an essential part of many transportation control plans, are means recommended to the public to help alleviate shortages in gasoline. Reductions in fuel consumption will range from 3 to 10 percent as a consequence of these provisions of the plans.

The application of evaporative control devices to gas stations and hydrocarbons storage facilities will also result in the conservation of gasoline. The inspection and maintenance provisions of the plans (included in 26 plans) will improve the fuel economy of motor vehicles by up to 6%, by assuring that they are functioning properly. In the Washington, D.C. area, for example, the control of evaporative emissions at gas stations will result in a savings of 11,000 gallons of gasoline a day, while the inspection of motor vehicles will lead to an additional savings of 150,000 gallons of fuel a day.

4. Pollutant Reduction Impact of Controls on Specific AQCRs

The specific controls applied under transportation control measures have a unique impact for each AQCR; generalizations as to the emissions reductions potential are not very helpful in understanding the impact of the measures. Detailed assessments of the emission reductions expected to be achieved by each control measure have been made for each

affected AQCR; these assessments are summarized in the appropriate Federal Register regulatory proposal or final regulatory action. The control requirements for specific AQCRs are summarized in Table III.

D. Maintenance of Standards and Prevention of Significant Deterioration of Air Quality

The Clean Air Act has a clear requirement for the maintenance of standards once achieved. Likewise, through judicial interpretation, prevention of significant deterioration of present air quality in the areas where air quality is better than that defined by the NAAQS is required. Both of these provisions of the Act will require increasing attention through the planning process.

Changes in geographical patterns of activity, or increased activity at the same geographical sites, may eventually result in increases in pollutant emissions. The current SIPs do not, in general, provide for the control of these additional emissions to the degree that would assure that the NAAQS are not violated in the future. The control strategy development process for SIPs has not, up to the present time, included this type of considersation. The control strategies have concentrated on the achievement of emissions reductions from existing sources, without specifically addressing the control of new or modified sources in relation to the maintenance of emission levels consistent with NAAQS achievement. The planning process must incorporate provisions for the preservation of desirable air quality.

The prevention of significant deterioration of air quality is not addressed in the currently approved SIPs. Growth may result in increased pollutant emissions in clean areas, i.e., areas currently not exceeding NAAQS. The Federal criteria for the SIP planning process are being modified to provide for State action to define and protect these clean areas.

The nature and magnitude of the restrictions necessary to implement these provisions of the Act will vary with the nature of the specific issue addressed, i.e., measures for maintenance of ambient air quality standards may vary from those for prevention of significant deterioration, but the conceptual problem is the same: An a priori determination of the nature of land use and an assessment of the air pollution impact of a variety of types of human activity are required. The most reasonable approach is the Federal establishment of criteria for a planning process that is implemented by the States, with the decisions as to the ultimate control choices left to the States.

Table III - Summary of Transportation Control Plans

EPA Region/ State/AQCR	Reduction required, %		Acceptable State portion (S) or EPA promulgation (E)																						
	CO	O_x[a]	Inspection/ maintenance	Catalytic retrofit	Air bleed retrofit	VSAD retrofit	High altitude modifications	EGR/air bleed	Gaseous fuel	Traffic flow improvements	Parking restrictions	Mass transit improvements	Additional stationary source controls	M/V excl. area	Bus/carpool locator	Gasoline limitations	Motorcycle emission regs.	Idling limitations	Bicycle lanes	Bus and carpool lanes	Mass transit incentives for employees	Miscellaneous measures	Extension granted, months
Region I																							
Massachusetts																							
Metropolitan Boston Interstate	59	68	E	E	E	E					E		E			E				E		--[b]	24(O_x)
Hartford-New Haven-Springfield Interstate	57	16	E							E	E			E	E							--[b]	14
Region II																							
New Jersey																							
New York, New Jersey, Conn. Interstate (Newark)	47	60	S/E	E				E			E		E		E	E				E	E	E[c]	14(CO) 24(O_x)
Metropolitan Philadelphia Interstate	44	45	S/E	E				E			E		E	E[d]	E	E				E	E		14(CO) 24(O_x)
New York																							
New York, New Jersey, Conn.	78	68	S	S						S	S			S								--[e]	24(HC) 19(CO)
Rochester	--	45	S										S										0
Region III																							
District of Columbia																							
National Capital Interstate (D. C., Va., Md.)	55	60	S/E	E[f]		E		E			S/E	S/E	S/E		S	E			E	S/E	S[g]		24(O_x)
Maryland																							
Metropolitan Baltimore Interstate (Baltimore)	57	62	E	E[i]		E		E[j]		E	E		S/E		E	S/E			E	E	E		24(O_x)
Pennsylvania																							
Metropolitan Philadelphia Interstate (Philadelphia)	55	53	S/E		S/E					E	S/E		S		E	S			E	E	E	--[k]	12(CO)
Southwest Pennsylvania Interstate (Pittsburgh)	57	48	E		E					E	E	E	E		E	S			E	E		--[k]	24(CO) 13(O_x)
Region V																							
Illinois																							
Metropolitan Chicago Interstate (Chicago)	50	--	E							E	E												0
Indiana																							
Metropolitan Indianapolis (EPA Proposal)	25	38	E			E							E		E						E		13(O_x)
Minnesota																							
Minneapolis-St. Paul	40	--								S	S	S									--[l,m]		0
Ohio																							
Metropolitan Cincinnati Interstate	--	43	E										S										0
Region VI																							
Texas																							
Austin-Waco	--	27											E									--[k]	0
Corpus Christi	--	56											E				--[n]					--[k]	0
Metropolitan Houston-Galveston	--	75	E			E					E		E		E	E[o]				E	E	--[p]	24(O_x)

Table III (continued) - Summary of Transportation Control Plans

EPA Region/ State/AQCR	Acceptable State portion (S) or EPA promulgation (E)																							
	Reduction required, %		Inspection/ maintenance	Catalytic retrofit	Air bleed retrofit	VSAD retrofit	High altitude modifications	EGR/air bleed	Gaseous fuel	Traffic flow improvements	Parking restrictions	Mass transit improvements	Additional stationary source controls	R/V excl. area	Bus/carpool locator	Gasoline limitations	Motorcycle emission regs.	Idling limitations	Bicycle lanes	Bus and carpool lanes	Mass transit incentives for employees	Miscellaneous measures	Extension granted, months
	CO	O_x[a]																					
Metropolitan Dallas-Ft. Forth	--	33											E		E					E	E	--[k]	0
Metropolitan San Antionio	--	45	E										E		E					E	E	--[k]	24(O_x)
El Paso-Las Cruces-Alamogordo Interstate	--	34											E									--[k]	0
Region VIII																							
Colorado Metropolitan Denver	64	56	S		S		S			S	S	S	E			E				S			24(CO) 24(O_x)
Utah Wasatch Front Interstate (Salt Lake City	89	--	S/E		S/E		S/E				S/E			E							--[m]		14(CO)
Region IX																							
Arizona Phoenix-Tucson Intrastate (Phoenix-Tucson)	66	33	S/E	S/E	S/E			S/E	S/E		E		S		S/E	S					E	--[p]	24(CO)
California San Francisco Bay Area	37	78	S/E	E		S				E	E		S/E		E	E[o]	E			E	E	--[b]	24(O_x)
Metropolitan Los Angeles	78	87	S/E	E		S				S/E	E		S/E		E	E[o]	E			E	E	--[b]	24(O_x)
San Diego	50	75	S/E	E		S				S/E	E		S/E		E	E[o]	E			E	E	--[b]	24(O_x)
Sacramento Valley	59	67	S/E	E		E					E		E		E	E[o]	E			E	E		24(O_x)
San Joaquin Valley	40	67	S/E	E		E					E		E		E		E				E		24(O_x)
Southeastern Desert	25	79	--[q]																				24(O_x)
Region X																							
Alaska Northern Alaska Intrastate Region (Fairbanks)	66	--	E	E	E			E		E	E			E				E					24(CO)
Oregon Portland Interstate	60	43	S							S	S	S											12
Washington Puget Sound Intrastate (Seattle)	55	20	S/E		E			E		S/E	S/E	S/E			E						--[m]		12(CO)
Eastern Washington-Northern Idaho Interstate (Spokane)	50	--	S/E		E			E			S/E	S/E			E				E		--[m]		12(CO)

[a] Percent reduction in HC emissions required.

[b] Pricing policies (E).

[c] Delivery prohibited.

[d] Trenton.

[e] Taxi ban, bridge tolls.

[f] Fleet.

[g] Aircraft and taxi control.

[i] On light-and medium-duty vehicles.

[j] Air/fuel control retrofit on light-, medium, and heavy-duty vehicles.

[k] Aircraft controls.

[l] Complete I-35.

[m] Fringe parking and transit.

[n] Off-highway user controls.

[o] 1977.

[p] Employee carpool incentives.

[q] Depends on control for Los Angeles.

2. Air Quality Maintenance

To assure the implementation of the maintenance of standards requirements of the Act, EPA promulgated revisions of the SIP preparation guidelines. These revisions of the planning process' criteria specify that States "... shall identify those areas (counties, urbanized areas, standard metropolitan statistical areas, etc.) which, due to current air quality and/or projected growth rate, may have the potential for exceeding any national standard within the subsequent 10-year period."* These regulations also modified the new source review procedures to include the need to review the source's indirect impact on air quality due to the emissions resulting from mobile source activities associated with the source.**

The "Air Quality Maintenance Areas" require a regional-scale analysis of the potential for violation of any NAAQS in the future. The cumulative impact of the growth in emissions of many sources that by themselves may not lead to the violation of the NAAQS (and that would be acceptable under an individual source review procedure) requires assessment if regional emission levels are to be maintained at levels consistent with the maintenance of NAAQS.

The indirect impact of selected sources (e.g., sports arenas, airports) requires an analysis only for the carbon monoxide air quality impact, at the specific site of the facility. The nature of the source-receptor relationship for all automotive-related pollutants is such that only the analysis for CO is appropriate. The other mobile source-related pollutants (i.e., HC and NO_x), due to their contribution to photochemical pollution, have a regional, rather than local, effect.

The guidelines for AQMA designation apply to the State agency responsible for designation. In most cases, this will be the State air pollution control agency. However, because the impact of the provisions for maintenance of standards will affect areas which are of concern to other State agencies and local general purpose governments (e.g., regional land-use and transportation planning, water pollution control), it is essential for the designating agency to involve them in the designation process.

To assist the States in identifying and analyzing the required Air Quality Maintenance Areas (AQMAs), guidelines for analyzing the impact of growth and other relevant factors were issued in the spring of 1974. Most AQMAs have been identified and are in various stages of the

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* 40 CFR 51.12(e).
**38 FR 13834; June 18, 1973, Federal Register.

public review process.* The timetable for plan revisions contemplates that by June, 1975, States will submit to EPA an analysis of impact on air quality of projected growth in AQMAs and, where needed, a plan to prevent any NAAQS from being exceeded over the 10 year period from the date of plan submittal.

EPA's designation of AQMAs for States which do not submit a list is based on SMSAs whose growth rates for particular demographic-economic indicators exceed a specified value. The critical growth rates per demographic-economic indicator would vary depending on the pollutant priority classification of the AQCR in which the SMSA is located. Thus, a lower critical growth rate would be specified for those areas having a currently significant air quality problem (e.g., Priority I regions) than for those areas which do not have a currently significant air quality problem (Priority III regions). Priority III regions would also be subject to procedural limitations to prevent significant deterioration of air quality. Areas selected by States as being allowed to reach secondary NAAQS levels would also be expected to be designated AQMAs.

3. Prevention of Significant Deterioration of Air Quality

Four alternative approaches to the implementation of the prevention of significant deterioration provision of the Clean Air Act were proposed by EPA on July 16, 1973. Alternatives proposed were intended to provide reasonable approaches to the issue and to stimulate public discussion on appropriate courses of action. The proposed alternatives were: The Air Quality Increment Plan, the Emission Limitation Plan, the Local Definition Plan, and the Area Classification Plan.

The proposed alternatives resulted in significant response from private citizens, environmental protection organizations, industry, and governmental agencies at public hearing and through written submissions to EPA. Extensive discussions were held with air pollution control officials, the governors of several States, and representatives of local officals. Based on the information gathered through this consultation process and technical considerations applicable to the issue, EPA has developed a tentative approach to the implementation of this provision of the Act. Regulations were proposed on August 16, 1974, in order that a period of public comment be afforded prior to final action, which is currently envisioned for the fall of 1974.

In reviewing public comments, several criteria for the regulatory

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* Appendix E lists the AQMAs and their status.

action were established:

- o The plan should allow for as much local flexibility in decision making as possible within Federally established procedural requirements.
- o The plan should incorporate air quality considerations into land-use planning, but should not establish land-use plans based only on air quality considerations.
- o Land-use decisions should not be based on an extremely tenuous data base.

The requirements of the planning process for implementing this policy of the Act consist of:

- o State division of its area into three classes.
- o State decisions as to intended use of the land classified under each of these classes.
- o A review of proposed development within these land-use classes to assure compliance with the air resource utilization decisions.

The regulations specify minimum criteria that the State review process must meet, as well as set criteria for determining acceptable uses of the air resource within the land-use classes established by the States. States are encouraged to delegate to local governments as many of these land-use decisions as practicable. As for all other SIP requirements, provisions are made for EPA action in case of State failure to act according to the specified criteria.

Classes are proposed as follows: Class I consists of the areas where almost no change in air quality is desired; Class II consists of the areas where modest changes in air quality are accepted (these increments are given in Table IV); and in Class III areas air quality levels may increase in concentration up to secondary NAAQS. In many cases, Class III areas would also be Air Quality Maintenance Areas (AQMAs) under the regulations for maintenance of ambient air quality standards. All areas would be initially classified as Class II, with States provided authority to reclassify areas. The designation of land areas into classes will publicly indicate a State's intent to provide for the type of air quality specified by the class designation.

In areas classified under Classes I and II, specified sources will be required to apply for a permit to construct. A review procedure will be employed which will allow an opportunity for State review of the sources's data, public comment to the State, and review of the decision by EPA. Unless the EPA Administrator disagrees with the State's evaluation

Table IV

Increases in Pollutant Concentration to be Allowed Under Regulations for Implementation of the Prevention of Significant Deterioration Provision of the Clean Air Act

Area Classification*	TSP ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)		
	Annual	24 hr.	Annual	24 hr.	3 hr.
Class I	5	10	2	5	25
Class II	10	30	15	100	700

* Class III areas would be allowed to reach the levels of the secondary NAAQS.

of the sources's impact and with the procedure followed, a construction permit would be issued if the source's impact on air quality would not cause the increment to be exceeded and the source (if not covered by New Source Performance Standards) applies Best Available Control Technology. In either Class I or II areas the guideline air quality increment may not be exceeded; however, areas may be redesignated. There is no limit as to the number of redesignations for an area.

Boundary problems involving interstate conflicts can result from the application of this plan. In case where another State's air quality is affected, the State could request that EPA intervene in an advisory role. If the issue could not be resolved, then the affected States could litigate.

Only particulates and SO_2 would be covered by these requirements. The "automotive pollutants" (i.e., CO, NO_x, and HC) are not covered. Carbon monoxide is not included because, as a pollutant, its only known or anticipated effect is on human health; the primary standard, which must be met in all areas, is fully protective of health. Furthermore, the Federal motor vehicle emission standards are expected to result in sizeable reductions in emissions on an area-wide basis for many years into the future.

Hydrocarbons and oxides of nitrogen are not included in this plan because, as with CO, national and regional emission trends are declining, and the nature of the HC-NO_x photochemical interaction indicates that specific source/receptor analysis is not appropriate. Their contributions to air pollution are functions of total mass emitted into the atmosphere over a large area. Federal motor vehicle control and Federal and State control of new or existing sources is expected to control this problem in most areas.

Appropriate revisions to the regulations will be made if the control of significant deterioration due to "automotive pollutants" (or due to additional pollutants for which national standards might be set in the future) becomes desirable.

III. State Implementation Plans: The Action Process--Compliance with Emission Limitations on Existing Stationary Sources

A. Introduction

Initial SIP development concentrated on the control of stationary sources of particulates and sulfur oxides since the control of these pollutants is relatively better understood (due to historical reasons) and a minor part of such pollution results from mobile sources. Requisite control of emissions of particulates and sulfur oxides is generally well within the capability of available technology. The requirements of the SIPs for the control of these pollutants must be implemented.

A few specific types of sources face problems related to their ability to meet emissions within statutory deadlines. After SIPs were approved within the deadlines imposed by the Act, it became clear that the cumulative impacts of the individual State requirements upon national demand for fuels and control equipment required assessment.

This part reviews the actions required to assure compliance with SIP provisions; reviews the policies EPA will follow in its relations with States and sources; and explains EPA's position on the alleged inability of some sources to comply with SIP requirements.

B. Historical Perspective: Action Process Implementation

Beginning in May 1972, EPA has approved or promulgated State implementation plans for the control of particulate matter and sulfur dioxide for all States, except for non-ferrous smelter requirements and the control of fugitive dust. The majority of these sources are stationary point sources. Portions of plans dealing with the abatement of carbon monoxide and hydrocarbons from stationary sources have also been approved. Transportation control measures required in addition to the Federal Motor Vehicle Control Program for carbon monoxide and photochemical oxidants NAAQS achievement are in the intial stages of implementation; they were described in Part II.

Of the Air Quality Control Regions classified as exceeding the health related standards for particulate matter and sulfur dioxide, all except nine (in which up to two year extensions in the NAAQS attainment dates were granted) require attainment of the health-related air quality levels by July 1975.

In order to achieve reductions in pollution called for in the SIPs by mid-1975, Federal and State activities must focus on ensuring compliance with emission limitations. The process of ensuring compliance with the emission requirements in the State Implementation Plans is

based on the successful accomplishment of three major facets of the enforcement program:

(1) Sources of air pollution which emit more than the allowed amounts of pollutant should be committed to an enforceable compliance schedule containing increments of progress;

(2) The increments of progress in the compliance schedule should be met in a timely manner; and

(3) Sources which were initially found in compliance or that come into compliance should continue to meet emission limitation requirements.

At the present time, the States and EPA are completing the first of the three major tasks in achieving compliance, i.e., the development of compliance schedules. While progress has been made in ensuring compliance for sources, it has been slow. State and EPA inability to quickly focus massive efforts into plan enforcement as well as the contention by the utility industry and others that control technology for the abatement of sulfur oxides from fuel combustion is unavailable have contributed to delays in the process.

EPA set February 15, 1973, as the date by which States had to submit compliance schedules establishing increments of progress where such increments were required. Regulations establishing the final emission limitations and compliance dates were required to be contained in the plan submitted by January 30, 1972; only the incremental steps (e.g., contract, start construction, finish construction) were covered by the deferred submission date. Where the emission control regulation contained acceptable increments (approximately 5,000 major emitting facilities are included in such requirements), no submission of individual compliance schedules was required. Although increments of progress are not necessary for sources affected by requirements with an effective date prior to January 1974, it is still necessary for the States or EPA to establish reasonable compliance schedules for such sources if the presently effective compliance date is unreasonable, i.e., control technology is not available within the specified time frames.

Despite substantial efforts by the EPA Regional Offices, only a few States officially submitted schedules for all affected point sources. Of the 20 states with regulations with final compliance dates after January 31, 1974, only 6 officially submitted any schedules in time to comply with the EPA promulgation deadlines, i.e., June 15, 1973, for approval and August 13, 1973, for promulgation of substitute compliance schedules.

Approximately 10,000 major sources have come into compliance with

the SIP. Most of these facilities are subject to a categorical-type schedule, that is, a schedule tailored to a class of sources, e.g., asphalt batch plants. Approximately 5,000 major facilities are still not in compliance. Of these, approximately 2,300 are on EPA approved compliance schedules, 1,500 are on State schedules, and the rest are in various stages of development.

C. Enforcement of SIP Provisions and Source Compliance Requirements

1. Introduction

There are still a significant number of sources out of compliance with the SIP requirements. There are clear solutions available for the problems presented by specific sources as impediments to compliance with the requirements of the SIP process; some allegations of problems are not substantiated by the facts of the case, i.e., control technology for power plants' compliance with the emissions limitations for SO_x is available and all such sources should be able to comply with the requirements.

It is clear that not all sources will willingly agree to achieve emission reductions required by the SIPs. EPA has the tools for assuring compliance of these sources with the Act's requirements in cases in which the States cannot proceed with the requisite enforcement actions. It is EPA's policy to fully utilize these tools for insuring that the Act's goals are achieved. The Act provides for a process of Federal action in enforcing the requirements of the SIPs. Outlined below are the EPA policies in implementing these provisions of the Act and the main features of this process.

2. Enforcement Policy

It is EPA's policy that violations of approved implementation plans be promptly prosecuted either by the appropriate State or local agency or by EPA. It is the intent of Congress, expressed in the Act, that the Federal government should defer to a State agency when such agency is moving effectively to abate a source in violation of the State's Implementation Plan. However, a notice of violation triggering Federal enforcement will be issued whenever it appears that the State cannot or will not take effective abatement action within a reasonable period of time. In cases where a State agency is willing to enforce but lacks the resources to do so, it may be preferable for EPA to support the State with technical assistance rather than initiate independent action.

It should be noted that implementation plans do represent requirements of Federal law and that EPA has ultimate responsibility for their enforcement. Where serious violations have occurred, Federal enforcement action may have more impact and may be required to provide adequate assurance of future compliance. EPA enforcement action in such cases

does not imply that the State agency has failed to perform its responsibilities.

EPA Regional Offices have the primary responsibility for the initiation and conduct of Federal enforcement actions under Section 113 of the Act. Notices of violation are issued by the Regional Administrators in accordance with guidance and policy established by the EPA Assistant Administrator for Enforcement and General Counsel.

One of the Agency's objectives is to ensure that all sources are in compliance or on an approved compliance schedule. In order to meet this objective, several mechanisms must be utilized, among them being the authorities established by Sections 113 and 114 of the Clean Air Act. A necessary condition for achieving this objective is the establishment and implementation of a compliance monitoring system in each EPA Regional Office; this system is to identify all significant sources, to locate sources previously overlooked, to ensure that those sources on a schedule meet incremental progress requirements of the compliance schedules, and to ensure that sources presently in compliance remain so.

3. Clean Air Act Authorities

Section 113 provides for Federal enforcement in cases of violation of a Federal standard or any requirement of a Federally approved implementation plan. In the case of a violation of a provision of a Federally approved implementation plan, the Administrator must first issue a notice of violation, unless the Administrator has declared that State in which the violation occurred to be in a "period of Federally assumed enforcement." (Federally assumed enforcement, under which Federal enforcement procedures are more expeditious, is appropriate whenever a State generally fails to enforce an implementation plan.) Thirty days after the issuance of a notice of violation, the Administrator may issue an order or bring a civil action.

In addition, Section 113 makes it a criminal offense for any person to knowingly violate any requriement of an applicable implementation plan more than 30 days after issuance of the notice of violation (or at any time during a period of Federally assumed enforcement). Criminal penalties are also provided for knowingly failing to comply with any of the Administrator's orders. The criminal penalties are a fine of not more than $25,000 per day of violation or by imprisonment for not more than one year, or both. For any subsequent conviction, the penalities are a fine of up to $50,000 per day of violation, or imprisonment for not more than two years, or both. The provisions of Section 113 also apply to the enforcement of the requirements set under the stationary source performance standards and hazardous pollutant standards provisions of the Act (Sections 111 and 112), and to the enforcement of information gathering activities authorized under Section 114.

To facilitate carrying out the requirements of the Act, Section

114 enables the Administrator to require owners or operators of emission sources to establish and maintain records; make reports, install, use, and maintain monitoring equipment or methods; sample emissions (in accordance with methods, locations, intervals, and in a manner as the Administrator shall prescribe); and provide other information. Section 114 also authorizes entry for certain purposes and the sampling of emissions.

Section 114 is a powerful tool when used for determining status of compliance of sources. The source can be required to provide the information which may be the basis for enforcement action by EPA. EPA Regional Offices are urged to make extensive use of Section 114 for enforcement purposes since this is usually the most effective method of obtaining the necessary information for initiating an enforcement action. Section 114 also enables the Administrator or his authorized representative to enter a source so that EPA can do its own monitoring, sampling, inspecting, or copying of records. This authority also can be used to determine whether a source is carrying out any obligations imposed on it by EPA under Section 114 and for obtaining information necessary to implement controls for overcoming emergency episodes (covered by Section 303).

Where a State has been delegated Section 114 authority from EPA, the same authority EPA has to monitor, sample, inspect or copy records, and any other authority under Section 114 can, in like manner, be exercised by the State. No representative of EPA need accompany State officials when exercising these delegated powers.

4. Compliance Process

The key element in the SIPs that affects sources and that is the basis for actions related to the enforcement of the requirements of the plan is the compliance schedule. The term "compliance schedule" refers to that part of any State regulation, order, decree, or other exercise of State authority which establishes the date or dates by which a source or category of sources is required to comply with an emission limitation and with specified increments of progress toward such compliance. Increments of progress include: (a) Submittal of the source's final control plan to the appropriate air pollution control agency; (b) contracts for emission control systems or process modifications awarded, or orders issued for the purchase of component parts to accomplish emission control or process modification; (c) initiation of on-site construction or installation of emission control equipment or process change; (d) on-site construction or installation of emission control equipment or process modification completion; and (e) final compliance achievement.

States may employ a variety of procedures to develop and issue compliance schedules. For example: (a) Schedules may be established in State control regulations, including regulations which set forth the emission limitation or other control measure to which the schedule

relates; (b) schedules may be imposed as conditions to a permit or license; (c) schedules may be established in special or general variances which revise a control regulation as it applies to a particular source or group of sources; and (d) schedules may be contained in administrative orders or in court orders, including consent decrees, which are submitted to EPA for approval as revisions of the applicable implementation plan.

In developing compliance schedules, the States may require sources to submit proposed schedules at the outset of the State procedure, or the State may hold negotiations or conferences with sources prior to issuance of a schedule. Regardless of the procedure followed in developing and issuing a compliance schedule, or whether the schedule supplements the original plan or is submitted as a revision to a plan, the schedule is approvable by EPA if: (a) The procedure followed by the State satisfies minimal procedural requirements specified in the regulations; (b) the schedule is enforceable; (c) the schedule requires full compliance by a specified date which satisfies the requirements of of 40 CFR 51.1(b); and (d) the schedule includes increments of progress to the extent required by 40 CFR 51.15(c).

It has been indicated that a substantial number of sources are not in compliance with these SIP requirements. For these sources, one of the following mechanisms must be used to establish schedules:

- If the compliance date is within the attainment date set by the approved SIP, States are to develop schedules and submit to EPA as plan revisions.

- If compliance date is beyond the attainment date in the SIP, EPA issues notice of violation and follows up with abatement order.

If a violator cannot reasonably be expected to comply immediately with an applicable requirement and has been making a good faith effort to comply, issuance of an order will normally be the most appropriate action. The time allowed for compliance is required by the Act to be a reasonable time (determined by the EPA Regional Administrator), "taking into account the applicable requirements." The person in violation must be given an opportunity to provide information on this point at the statutorily required conferences (Section 113(a)(4) of the Act). An essential part of this process is consultation with appropriate State officials to minimize the possibility of Federal duplication of State action.

The date ultimately selected for compliance should be the earliest date which satisfies the requirement of Section 113(a)(4). Whenever possible, the order should contain increments of progress towards ultimate

compliance and associated dates to keep the violator on a tight abatement schedule. It should be noted that while the order issued by EPA may provide for compliance at a date later than that specified in the SIP, it cannot vary from the plan in any other way.

As of June, 1974, EPA had issued notices of violation to some 205 facilities and abatement orders to 79 of these. In addition, some 2,000 Section 114 letters (i.e., requesting information) have been issued, and 1,500 inspections, tests, and opacity observations have been conducted by EPA to ascertain compliance status of sources. These investigations are expected to culminate in the establishment of compliance schedules by either the State or EPA.

5. Federal Facilities Compliance

In response to Executive Order 11282, dated May 26, 1966, Federal departments, agencies, and instrumentalities initiated organized programs to control and abate air pollution from the facilities under their management. This program was continued and strengthened by E.O. 11507, dated February 4, 1970.

Section 118 of the Clean Air Act (enacted after the issuance of E.O. 11507) directed Federal agencies to:

> "... Comply with Federal, State, interstate and local requirements respecting the control and abatement of air pollution to the same extent that any person is subject to such requirements."

The Administrator of EPA, on January 26, 1973, requested the Federal agencies to: (1) Provide the States the information and data they need to determine compliance with standards, (2) develop compliance schedules in cooperation with the States, and (3) report to EPA the compliance status of their facilities. All of the States were also informed of this policy.

On December 17, 1973, the President signed Executive Order 11752, which superseded E.O. 11507. This new Executive Order directs Federal agencies to cooperate with States and to comply with "Federal, State, interstate, and local substantive standards and substantive limitations" (emphasis added).

Compliance by Federal facilities with substantive State and local air quality and emission standards is accepted by all as operative policy. Major Federal agencies contend, however, that complying with administrative procedural requirements infringes upon the constitutional principle of Federal supremacy. Examples of such procedural requirements are payment of fees, obtaining permits, and submitting plans to State and local control agencies for approval.

Several States believed that Section 118 authorized them to impose procedural requirements on Federal agencies. On June 5, 1974, the U.S. Court of Appeals for the 6th Circuit, in ruling on a suit initiated by

Kentucky (who was joined by California, Texas, and Virginia), found that Section 118 was intended to force compliance by Federal facilities with substantive standards set by States and was not intended to subject Federal agencies to State administrative requirements.

EPA's policy for Federal facilities stems from the Clean Air Act as interpreted by the Courts and from E.O. 11752. Under this policy, all Federal facilities are required to comply with all applicable substantive standards and limitations, but they are not required to comply with State or local administrative requirements. Federal agencies shall cooperate with EPA and the State and local air pollution control agencies to insure compliance with applicable substantive standards. EPA will assure compliance by Federal facilities with the applicable standards and limitations.

For a more detailed discussion of pollution abatement and control at Federal facilities, see EPA's Federal Activities Strategy Paper.

D. Specific Source Compliance Problems

1. Introduction

Some sources have alleged that SIP emission limitations are unreasonable and impossible to comply with; EPA has examined the issues and found them to be solvable within the policy framework of the Act. The nature of the problems can be generally summarized under the following categories: (1) The preferred techniques for complying with emission limitations by combustion sources, i.e., switching to clean fuels, are not generally applicable due to lack of appropriate supplies of such fuels; (2) certain sources cannot achieve requisite emission reductions on a continuous basis without economically ruinous control measures, i.e., permanent production curtailment; and (3) assumptions as to the feasibility and propriety of certain control measures require revisions due to improvements in techniques since the initial SIP planning cycle.

This section of the paper explains the relationship between evolving EPA policies and the resolution of these problems within the context of the Act's policies. EPA's assessment of the compliance problems of the power industry is summarized and action requirements specified.

2. Power Plant Compliance

There are about 970 fossil-fueled power plants in the U.S. Approximately 55% of generating capacity is obtained from burning coal, 17% from oil, and 28% from gas. All gas-fired plants are obviously now in compliance with sulfur oxide emission limitations. Some of the coal-and-oil-fired plants were in compliance with sulfur oxide (SO_x) emission limitations when these were adopted and many other plants have been or are being brought into compliance by converting to fuels having lower sulfur contents. Some of these changes were brought about by economic considerations (i.e., fuel oil being less costly than coal at

the time of conversion) rather than environmental protection requirements. However, this change in fuel use has resulted in an undesirable increase in oil imports and has increased our dependence on unreliable foreign sources of fuels. Current fuel prices are favoring reconversion to coal on the basis of economic considerations alone.

Switching to a low-sulfur fuel would seem to be the simplest route to compliance with SO_x emission requirements. However, reliance on use of low-sulfur western coal (the only supply source available in the requisite amounts other than imported oil) by plants east of the Mississippi River would result in a failure to use readily available high-sulfur eastern coal and raises serious questions as to the possibility of supplying the eastern coal market with western coal within any reasonable time period. The reliance on fuel conversion to achieve SO_x emissions reductions would aggravate the existing shortage of low-sulfur fuels. Since supplies of low-sulfur fuels will be insufficient, flue gas desulfurization (FGD) systems will be required on a large number of power plants in order to achieve compliance with SO_x emission limitations. Use of FGD systems will enable power plants to meet emission requirements while using readily available high-sulfur fuel resources and severing their dependence on imported fuel oil supplies.

Currently, there are 11 units operating with FGD with a total electricity production capacity of 2,276 megawatts. There are a total of 57 units planned for operation or operating with FGD, for a total capacity of 20,687 megawatts. Figure I summarizes the National need for FGD in terms of total electrical power generating capacity that would require FGD for the period 1976 through 1981; three different assumptions are given as to the levels that are probably required. The estimate of the probable situation indicates that approximately 80,000 megawatts of capacity would have to have FGD installed by 1980, or approximately a four-fold increase over the levels committed to date. These figures should be compared with total national electric power generating capacity of approximately 300,000 megawatts.

Many utilities have suggested that, rather than meet existing SO_x emission requirements, they be allowed to use Supplementary Control Systems to achieve ambient air quality standards. EPA considers constant emission reduction techniques, such as FGD, far superior to dispersion techniques due to the effects of SO_x that are not accounted for by the present NAAQS, e.g., sulfate formation, acidification of soil and water. (Dispersion techniques can, however, often be appropriately required as interim steps, to minimize the impact of plant operation on air quality, in schedules requiring compliance with emission limitations.)

The utility industry's allegations and failure to install control equipment that would result in compliance with emission limitations have created a difficult situation in relation to compliance with SIPs. In order that all the available evidence be brought to bear on the resolution of the issues, EPA held a special public hearing in Washington, D.C., from October 18 to November 2, 1973, to review the status of power

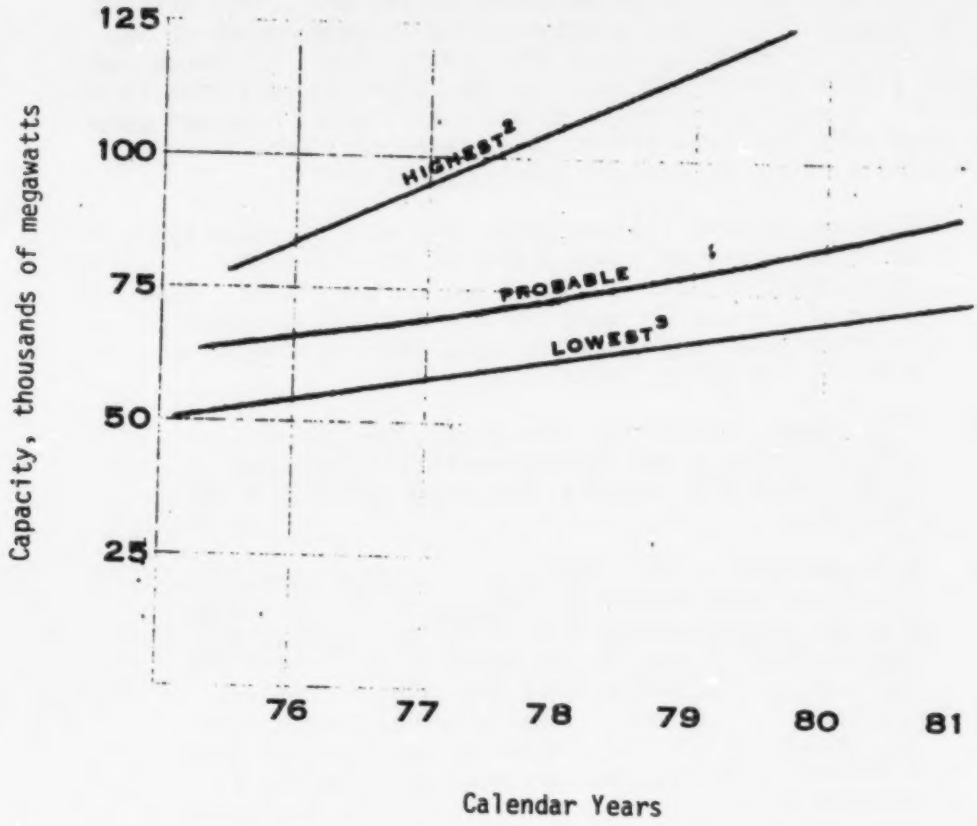

Figure I - Cummulative Need for

FGD for Coal-Fired Power Plants [1]

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1. Includes new and existing coal-fired plants requiring controls to achieve primary standards or new source performance standards.
2. Based on pessimistic projections for new low sulfur coal supplies and minimal redistribution of existing supplies.
3. Based on optimistic projections for low sulfur coal supplies and maximum redistribution of existing supplies.

plant compliance with sulfur oxide emission limitations. This hearing was required because: (a) Power plants are the largest source of SO_x emissions in the U.S. (emitting about 60% of total SO_x), (b) large numbers of power plants are not yet in compliance with SO_x emission limitations, and (c) in most cases, only one and a half years remained under the established SIPs for these plants to achieve compliance.* Some of the principal findings of the EPA hearing panel are:

- Flue gas desulfurization technology must be installed on large number of power plants if SO_x emission limitations in SIPs are to be met in the 1970's. Supplies of low-sulfur fuels are now and will continue to be inadequate to provide the sole means of complying with SO_x emission limitations.

- With several noteworthy exceptions, the electric utility industry has not aggressively sought out solutions to the problems they argue exist with FGD technology.

- Although most utility witnesses testified that FGD technology was unreliable, created difficult sludge disposal problems, and that it was too costly, the hearing panel found, on the basis of utilities' and FGD vendors' testimony, that the alleged problems can be, and have been, solved at a reasonable cost. The reliability of both throw-away-product and saleable-product FGD systems has been sufficiently demonstrated on full scale units to warrant widespread commitments to FGD systems for SO_x control at coal- and oil-fired power plants.

- The utility industry has generally lacked a real incentive to develop FGD technology and to install this technology where needed to meet SO_x emission requirements.

The hearing panel concluded that:

- The electric utility industry should: (a) Make immediate commitments to install FGD systems where needed to meet SO_x emission requirements, giving priority to those sources where controls are needed to meet primary ambient air quality and new source performance standards; (b) aggressively pursue FGD developmental programs to improve reliability, to lower operating costs, and to advance FGD technology that results in a saleable by-product; (c) undertake further characterization and evaluation efforts on sludge disposal, with

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* The Hearing Panel's findings are contained in Report of the Hearing Panel: National Public Hearings on Power Plant Compliance with Sulfur Oxide Air Pollution Regulations; EPA, January 1974.

emphasis on large scale systems, to assure the widespread applicability and effectiveness of sludge disposal systems at reasonable cost; and (d) hire (and train) personnel with the skills needed to properly design and operate FGD systems.

- EPA and the States should: (a) Create a stong incentive for the installation of FGD systems by establishing expeditious but reasonable compliance schedules and by vigorously enforcing these schedules; (b) formalize procedures for dealing with unpreventable control system malfunctions where such formal procedures do not already exist; (c) urge State public utility commissions to treat increased costs from FGD control in the same manner as increased fuel costs are treated; and (d) consider such methods of creating an incentive to control SO_x emissions, such as a charge (tax) on SO_x emissions.

- Compliance schedules established by the utilities, States and EPA should: (a) Be developed for each utility after considering the number and types of plants requiring FGD systems and the need to properly sequence installations to preserve utility power reserves; (b) give priority to installations of FGD systems at those plants where systems are needed to meet primary ambient air quality standards and new source performance standards; (c) require installation of FGD systems at a rate commensurate with vendor capacity; and (d) require, where feasible, the use of interim control measures, such as Supplemental Control Systems, in order that the impact of SO_x emissions on air quality be minimized until FGD systems can be installed. The development of compliance schedules incorporating these criteria should be facilitated by prospective extensions of final compliance dates envisioned by amendments to the Clean Air Act.

A program to carry out these power plant recommendations has been initiated; in particular, basic data on each power plant is being gathered and a strategy is being developed to establish compliance schedules for all utilities based on the priorities established. Approximately 90 power plants have been identified for EPA investigations and legal action. Approximately one-half of these power plants are currently involved in various stages of litigation.

3. SIP Requirements Changes

a. Clean Fuels Policy

EPA studies show that if SIP control requirements that affect supplies of low-sulfur coal were enforced, there would be a significant shortage of coal amounting to about one-half of the combustion coal

demand in 1975 and 1977. (Nineteen seventy-five demand is currently estimated to be about 550 million tons and 1977 demand is estimated to be 610 million tons.) EPA recognized, when it approved the State Implementation Plans, that there would be a shortage of acceptable coal if all the States enforced their control regulations.

To alleviate this potential shortage, EPA developed a policy (the "Clean Fuels Policy") of encouraging State review of plans in order that sulfur emission limits be modified whenever this could be done without exceeding the primary air quality standards. The date of achievement of secondary standards (protective of welfare, e.g., vegetation), in many cases adopted by the States as the same as that for primary standards, i.e., 1975, is also being revised under this process. The policy encourages the States to analyze their control requirements in a more detailed fashion than was generally done at the time of initial SIP development; substantial technical support to States is provided by EPA. These actions are specific to each State, as the degree of control required to achieve the primary standard varies widely between air quality control regions and individual sources in each region.

The policy is designed to promote State review and subdivision of large air quality control regions in order to make regulations more directly related to regional air quality needs. EPA has analyzed individual power plants (through use of diffusion modeling) in relation to air quality requirements in order to identify those plants which could burn a higher sulfur fuel than required under previously adopted regulations, without violating the primary standard. These studies show that the Clean Fuels Policy has the potential for reducing the shortages of low-sulfur coal in 1975 and 1977 by about 40%. The ultimate resolution of the issues resides to a major extent in the application of control technology that would allow the use of high-sulfur containing fuels for energy generation.

The Clean Fuels Policy, when implemented by a State, requires changes in State regulations and compliance schedules (all part of the SIP). Such changes require public hearings and ultimate approval by the Administrator of EPA.

The Clean Fuels Policy, which aims at basic regulatory changes, should not be confused with other provisions of the Act. Variances may be given in cases where extenuating circumstances require deviations from compliance schedules. These circumstances might include special problems in obtaining the required quality of fuel or unavoidable delays in the installation of control equipment. Such variances are for relatively short times and in no case beyond the date of mandatory attainment of the primary NAAQS. The granting of the variance follows public disclosure and EPA approval since compliance schedules which would be changed are part of the SIP, and SIP changes must conform with the prescribed procedures.

The way in which initial compliance schedules may be legally extended beyond the mandatory date for attainment of NAAQS is under the provisions of Section 110(f) of the Act. Under this Section, compliance dates may be extended "... for not more than one year ..." beyond mandatory dates. The extension may be given for a source or group of sources only where good faith efforts have been made to comply, such compliance is impossible or impracticable due to lack of appropriate technology or alternative methods, and the continued operation of the source or class of sources is essential for national security, public health or welfare requirements. Available procedures must have been used which will reduce the impact of such sources on public health. Extensions under Section 110(f) can only be obtained through the request of the Governor to the Administrator of EPA and his approval. Public hearings must be held. Decisions are subject to judicial review.

In summary, the Clean Fuels Policy is aimed at fundamental SIP changes which can be made as a result of careful analysis and which are completely consistent with attainment of NAAQS in the mandatory time frame. Variances have a much sharper focus and are constrained by the mandatory dates. Section 110(f) actions allow a maximum of one year extension of the mandatory date in the case of the specified sources following certain proofs and interim actions. All of the above involve changes to the SIPs, which then necessitates public disclosure, discussion, and EPA approval actions. The Act thus provides some flexibility of response to unforeseen circumstances but sharply circumscribes the time latitudes and processes in making such responses.

b. Supplemental Control Systems

Supplemental Control Systems limit the rate of pollutant emissions during periods when meteorological conditions conducive to ground-level pollutant concentrations in excess of NAAQS exist or are anticipated. These systems take advantage of the changing dispersive capacity of the atmosphere and, thus, they are an alternative to the application of constant emission reductions that would otherwise be required for NAAQS achievement.

EPA's position had been that the use of Supplemental Control Systems (SCS) was not acceptable for attaining and maintaining NAAQS since SCS were not considered reliable enough to preclude NAAQS violations. On September 13, 1973, regulations were proposed which recognized that in certain cases substantial and consistent improvement in SCS performance had occurred, to the degree that it would now be possible to develop SCS as a reliable means of attaining and maintaining the national standards in carefully selected situations. This proposal stated that SCS was a "partially and temporarily" acceptable

strategy, i.e., not as desirable as constant emission limitations, but necessary under some circumstances.

Current policy is that constant emission limitation is the preferred strategy for attaining and maintaining the national standards. SCS is acceptable only as a temporary measure where constant emission limitation measures are demonstrated to be unavailable on a case-by-case basis, and only in circumstances wherein the SCS can reliably attain and maintain the national standards. However, the factors to be considered in determining the availability of constant emission limitation measures have not yet been completely specified by the Agency. In the case of non-ferrous smelters, most issues have been resolved and source-specific regulations are being developed to complete affected SIPs. In the case of fossil fuel-fired power plants, major issues remain unresolved and the Agency is not yet in a position to promulgate regulations permitting use of SCS on power plants.

The September 14 proposal also stated that stack height extensions beyond the level of "good engineering practice" would not be an acceptable air quality control measure unless accomplished as part of an approved SCS. The proposed regulations were actually a statement of the EPA "Tall Stack Policy" which evolved from the Natural Resources Defense Council (and others) suit over the Georgia SIP. This suit included the claim that use of "Tall Stacks" (i.e., atmospheric dilution) was not a legal method for attaining the national standards. The court concluded that attainment of the NAAQS should be achieved primarily through use of emission reduction controls rather than dispersion enhancement techniques and that the use of dispersion techniques is permitted only if exclusive reliance on emission controls is infeasible.

EPA recognizes that increasing the height of stacks plays a useful, but limited, role in the thrust to attain ambient air quality standards and to maintain the quality of the air environment. Since 1960, there has been a pronounced trend toward increasing the height of stacks. Not so well recognized has been the accompanying and simultaneous trend toward substantially greater emissions at single locations. There are many environmental insults, as yet unquantified, that make undesirable the use of tall stacks in lieu of the application of constant emission control.

The effects of total atmospheric loading of pollutants, particularly of sulfur oxides, are of great concern. Effects of total loading by sulfur oxides include suspended sulfate formation, acid rainfall, acidification of soil and water, visibility reduction, changes in the colloidal stability of clouds and changes in the transmission of radiant energy through the atmosphere. For these reasons, the attainment of national standards by means of constant emission reduction is preferable

to the use of increased stack height to alleviate the ground-level impact of sulfur oxide emissions.

Increasing the height of stacks can reduce the probability of occurrence of high ground-level concentrations that are experienced with shorter stacks under a few types of meteorological and facility- and terrain-related conditions. Increasing the height of the stack cannot reduce the frequency of high ground-level concentrations that are experienced with shorter stacks under other conditions, the peak short-term concentrations beyond 5-6 miles from the source, and the amount of pollutants emitted.

It is considered good engineering practice to construct a stack sufficiently tall to minimize the effects of the plume being entrapped by factors related to aerodynamic conditions for a specific facility whose emissions are great enough to threaten air quality standards and to minimize the threat of the plume impacting local terrain. The stack height that represents good engineering practice requires a case-by-case judgement based on detailed engineering and meteorological investigations of the specific site.

Increasing stacks to heights which exceed good engineering practice is not considered an acceptable control strategy except in very limited instances. Briefly, an extension of a stack to a height exceeding good engineering practice may be a part of a control strategy if the action to increase the stack height is taken in conjunction with the development and operation of a supplemental control system.

IV. Federal Standards

A. New Source Performance Standards

1. Introduction

The setting of performance standards for new sources under Section 111 of the Act contributes to the achievement of the Act's goals by preventing or reducing the magnitude of increases in emissions from stationary sources resulting from expanded industrial activity and/or new or modified sources. This helps to maintain National Ambient Air Quality Standards and prevents significant deterioration of air quality in those areas where present air quality is better than that required by the NAAQS. NSPS provide a mechanism by which the Federal Government determines (and makes available to States) the feasibility of control for emerging industries. In addition, NSPS provide the only means for control of selected pollutants for which a NAAQS or hazardous pollutant designation are not applicable.

2. SIP Complement

The prevention of air pollution problems due to future growth in hydrocarbon emissions and nitrogen oxides emissions is highly dependent on the controls that are to be applied to new sources of these pollutants. The problem related to NO_2 is currently of low significance; only five AQCRs are classified as Priority I. However, there is a clear danger that increases in emissions due to expanded economic activity will lead to widespread NAAQS violations by the 1980s unless all new sources are controlled. The current control philosophy for mobile sources envisions the need for stringent NO_x controls in the 1980s; a complementary program for the control of stationary sources is required. The setting of standards for new sources now is preferable to the setting of control requirements under the SIP process later in order to prevent the possibility of widespread NAAQS violations in the future. NSPS, in this case, complement the SIPs.

The current SIP control strategies for hydrocarbons assure the achievement of NAAQS for the specific AQCR involved. Transport of hydrocarbons to other areas where they contribute to high oxidant levels is not currently accounted for by SIPs. Evidence exists that high oxidant concentrations (above background levels) in non-urban areas are related to atmospheric loading of hydrocarbons which were transported from densely populated areas. The need to prevent increases in emissions of hydrocarbons from new stationary sources is similar to the need for such control of NO_x.

The application of control measures to new sources prior to the need for such controls under SIPs is effective for preventing NAAQS violations in the future and for minimizing air quality deterioration, regardless of pollutants involved. NSPS provide the mechanism for achieving this

SIP-complementing objective. The maintenance of NAAQS, the prevention of significant deterioration of air quality, and the control of emerging industries are facilitated by the setting of NSPS.

3. Sources Covered by NSPS

Standards of performance for the first group of five source categories were promulgated December 23, 1971. The industries, pollutants, and facilities covered are:

Group I NSPS

Sources Covered	Pollutants Controlled	Affected Facility
Fossil fuel-fired steam generators	SO_2, NO_x, & particulate matter	Each fossil fuel-fired steam generating unit of more than 250 million B.T.U. per hour heat input.
Incinerators	Particulate matter	Each incinerator of more than 50 tons per day charging rate.
Portland cement plants	Particulate matter	Kiln, clinker cooler, raw mill system, finish mill system, raw mill dryer, raw material storage, clinker storage, finished product storage, conveyor transfer points, bagging and bulk loading and unloading systems.
Nitric acid plants	NO_x	Each nitric acid production unit.
Sulfuric acid plants	SO_2, acid mist	Each sulfuric acid production unit.

These standards were effective August 17, 1971. All affected sources that are being or have been modified or construction started as of this date must comply with the standards.* Judicial review of the standards for portland cement plants, sulfuric acid plants, and steam generators

* Definitions of applicability of standards are contained in 40 CFR 60.

was initiated in late January 1972. Court opinions supporting EPA's position were rendered in September 1973, although in each situation the case was remanded to EPA for clarification.

The general provisions of the regulations on standards of performance were revised by promulgation of regulations on start-up, shut-down, and malfunction on October 15, 1973. An additional major revision is being drafted to clarify interpretation and application of the standards to modified sources.

Standards of performance for seven additional source categories (Group II) were proposed June 11, 1973. Promulgation took place in March 1974. The sources covered are:

Group II NSPS

Sources Covered	Pollutants Controlled	Affected Facility
Asphalt concrete plants	Particulates	Process equipment
Petroleum refineries	Particulates, carbon monoxide, and hydrogen sulfide	Catalyst regenerators fluid catalytic cracking units, process gas burners
Storage vessels for petroleum liquids	Hydrocarbons	Entire facility
Secondary lead smelters	Particulates	Furnaces
Secondary brass and bronze ingot production plants	Particulates	Furnaces
Iron and steel plants	Particulates	Basic oxygen process furnaces
Sewage treatment plants	Particulates	Sludge incinerators

The following sources are currently in process of control regulations formulation: Primary copper, zinc, and lead smelters (Group II-A); the schedule currently followed envisions proposing these regulations by the end of 1974. Kraft pulp mills, primary aluminum reduction plants, coal cleaning plants, ferroalloy plants, stationary gas turbines, iron and steel mills, and phosphate fertilizer plants will be regulated by early

1975. Priorities are being set for control of additional sources; among these are grain terminals, by-product coke ovens, chlor-alkali plants, lime plants, refuse combustion, and gasification of fossil fuels.

4. Control of Selected Pollutants

Section 111(d) of the Act provides a mechanism for the control of pollutants not covered by criteria (Section 108) or National Emission Standards for Hazardous Pollutants (Section 112). These pollutants are classified as non-criteria pollutants. The Act provides that States set up a system for the control of existing sources of the non-criteria pollutants for which EPA sets NSPS. Sulfuric acid mist from sulfuric acid plants is currently covered by this requirement. The criteria to be used for developing State control programs will be developed by EPA at the end of 1974. Prospective NSPS will require the control of fluorides from existing primary aluminum plants and the phosphate fertilizer industry.

5. System for Assuring Compliance with New Source Performance Standards

Pursuant to policies set by the Clean Air Act, delegation of authority to enforce promulgated standards to State agencies has begun and will continue as standards are promulgated and States are capable of enforcing them. It is the Agency's policy to delegate the authority to enforce these standards to the States whenever the State meets requisite criteria, i.e., the State submits a plan for enforcement of the NSPS and EPA approves it. It is expected that about three-fourths of the States will request and be eligible for delegated authority, i.e., they will have resources requisite for carrying out an acceptable enforcement plan.

Enforcement of NSPS entails maintaining surveillance over sources covered, preconstruction review at the request of the source owner or operator, observation of source tests and evaluation of results, and enforcement proceedings against sources found not to be in compliance. EPA involvement with the delegated NSPS entails the monitoring and evaluation of State enforcement progress; making determinations on how the standards are to be applied; the provision of technical advice and support; and, if needed, direct enforcement action.

Since it is important to assure a uniform national application of NSPS, EPA headquarters will establish policy and provide assistance to the EPA Regional Offices in making determinations of applicability of the NSPS. These activities, at both State and Federal levels, are not substantively different from those required to carry out SIPs.

B. National Emission Standards for Hazardous Air Pollutants

1. Standards

Section 112 of the Clean Air Act requires the Administrator to establish national emission standards for hazardous air pollutants. A hazardous air pollutant is defined as "...an air pollutant to which no ambient air quality standard is applicable and which...may cause, or contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness."

A list of such substances (identifying asbestos, beryllium, and mercury as hazardous pollutants) was published in the Federal Register on March 31, 1971. In accordance with waiting periods and public hearing requirements of the Act, proposed regulations for their control were published in the Federal Register on December 7, 1971. Final regulations were promulgated April 6, 1973. Clarifying regulations were promulgated May 3, 1974.

Sources covered by the NESHAP are: For asbestos, asbestos mills, surfacing of roadways with asbestos tailings, miscellaneous manufacturing operations, demolition, and asbestos spraying. For beryllium, extraction plants, ceramic plants, foundries, incinerators, propellant plants which process specific beryllium-containing materials, rocket motor test sites, and machine shops which process beryllium, its oxides, or specific alloys. For mercury, stationary sources which process mercury ore to recover mercury, and to those which use mercury chloralkali cells to produce chlorine gas and alkali metal hydroxide.*

Shortly after the final regulations were promulgated, the Environmental Defense Fund (EDF) filed a civil action against EPA claiming that the standards did not provide an ample margin of safety to protect public health. Several meetings and discussions have taken place between representatives of EPA and EDF. EPA has initiated extensive investigations of several unregulated sources of asbestos and mercury, e.g., fabrication operations and disposal of asbestos waste materials, to determine if such sources should be covered by the standards. Other sources of asbestos emissions may be covered by the standards some time in the future. Sewage sludge incinerators are being investigated to determine whether their mercury and beryllium emissions should be controlled.

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* The regulations are contained under 40 CFR 61; a detailed explanation of the Agency's position on the control of these pollutants may be found in the April 6, 1973, Federal Register, 38 FR 8820, et. seq.

Although strong evidence exists that man's use of mercury alters its natural distribution in the environment, that such uses may cause or hasten additional deposits into water or soil over and above those occurring naturally, and that mercury levels accumulate in the biota (with the result that potentially dangerous residue levels are reached in food consumed by man and animals), current data on the environmental transport of mercury do not permit a clear assessment of the effect of mercury emissions into the atmosphere on the mercury content in the aquatic and terrestrial environments. The current standard is intended only to protect the public health from the effects of inhaled mercury.

At this time there are no new pollutants scheduled to be added to the list of hazardous air pollutants. However, investigations are currently underway for several pollutants to determine the optimum control option for each, which may include Section 112. One such pollutant is vinyl chloride.

2. Enforcement of National Emission Standards for Hazardous Air Pollutants

The National Emission Standards for asbestos, beryllium, and mercury require new sources to be in compliance upon promulgation. Existing sources have up to 90 days to achieve compliance or they may obtain a waiver of compliance for a period of up to two years after a promulgation. To date, Regional Offices, after investigating some 13,000 potential sources, have registered 675 stationary sources subject to NESHAP; 550 of these are presently in compliance and 125 are covered by waivers. Demolition and asbestos spraying operations' owners or operators are required to report to EPA 20 days in advance of such operations.

Guidelines have been issued establishing EPA procedures for notifying affected sources of the NESHAP requirements, handling requests and notifications required by NESHAP, and reviewing waivers of compliance and source testing. Regional Offices are maintaining surveillance over sources in the subject categories, observing source tests and evaluating results, and carrying out enforcement proceedings against sources found not to be in compliance.

The activities may be carried out by States when they are delegated enforcement authority, i.e., when they submit an acceptable plan for carrying out such actions. It is the Agency's policy to delegate enforcement authority to States; they are encouraged to develop programs for enforcing these regulations. A precondition for delegation of responsibility is assurance that the State is capable of carrying out an adequate program and that semiannual reports will be submitted to EPA Regional Offices on the progress of such a program. States may be delegated responsibility for enforcement of all or major parts of the NESHAP.

Once authority is delegated to the States, EPA involvement will entail monitoring and evaluating State enforcement progress; making determinations on how the standards are to be applied; and rendering technical advice and support. If a State fails to adequately carry out its delegated functions, or if other circumstances so dictate, EPA will take direct enforcement action. EPA Headquarters will establish policy and provide assistance to Regional Offices in making determinations of applicability of NESHAP.

C. Mobile Sources

1. Introduction

Mobile sources of air pollution are significant contributors to urban air pollution. In our cities, almost all of the carbon monoxide, more than half of the hydrocarbons, and slightly less than half of the nitrogen oxides come from mobile sources. The Clean Air Act, under Title II,* provides for the reduction of mobile source emissions by establishing a system for controlling emissions from motor vehicles, engines, and aircraft.

Title II implements a philosophy of requiring control of these sources at the most effective control point (i.e., the manufacturer), and also places the burden of compliance at this point insofar as new, and properly maintained and used, vehicles are concerned. Maintenance of vehicles by owners is to be assured by transportation control measures (i.e., inspection programs) and by the implementation of the Act's provisions that would require the manufacturers to warrant the emissions performance of properly used and maintained vehicles, thereby providing an incentive to consumers for proper use and maintenance.

Congressional intent, reflected in the Act's philosophy, is to achieve reductions in emissions from motor vehicles by the incorporation of technological advances and solutions to the emissions problem into new motor vehicles at the point of manufacture. This is the most effective point for the incorporation of design changes and the addition of appropriate control devices, if any are required. The manufacturers are also charged with the responsibility for developing the technology required to meet emissions standards.

The Act places the burden of producing vehicles that meet emissions performance specifications set by EPA on the manufacturer by providing enforcement tools and requiring warranties. Among these are the requirement of testing prototype vehicles and engines prior to their introduction into commerce and the authorization of inspection and testing of motor vehicles at the end of the assembly line, the recall of vehicles found to be deficient in their emissions performance when in actual use, civil sanctions for vehicles not produced in conformity with

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* Title II of the Act is also known as the "National Emission Standards Act."

the conditions under which a certificate of conformity was issued, the establishment of tests for the use of States that would ultimately require that a manufacturer warrant the vehicles' emissions performance if they are found to fail a State emissions inspection, and product defect warranties.

This section examines the history and impact of the emissions standards for mobile sources, the EPA programs that implement them, and the prospects for future control actions.

2. Light-duty Vehicles Control

a. Standards

Federal control of new passenger automobile's emissions (in conjunction with light-duty trucks, those under 6,000 lbs. gross vehicle weight) began with the 1968 model year. (California had imposed standards two years earlier, under State law.) Initially, CO and HC were controlled. Test procedures were revised and the standards made more stringent for the 1970 model year, and again for the 1972 model year. Beginning with the 1973 model year, standards also applied to emissions of NO_x.*

The standards set through the 1974 model year were based on estimates of technological feasibility at reasonable costs; the premise was that any control feasible in the near term could not approach the stringency requisite to solve urban air pollution. The Clean Air Amendments of 1970 revised this strategy for light-duty vehicles. Using as the basis for decisions estimates that had been developed as to the levels of passenger car control that would be required to adequately protect air quality in the most polluted cities of the United States by the sole application of control technology (a measure that would eventually obviate the need for transportation controls), the Congress, in effect, established numerical emission standards, to be applicable for HC and CO in the 1975 model year, and for NO_x in 1976, without regard to the technological feasibility or the cost of meeting such standards.

Congressional action was based on a clear need to force additional industry commitment to solving automobile-related pollution problems. The Act embodied provisions for Congressional review of the statutory emission standards requirement prior to the date of its final application. These standards could be suspended by EPA for one year, with stringent interim standards to apply in the case of a suspension. Such suspensions were granted in the spring of 1973. The Congress has initiated a review of EPA's decisions, the need for, and the achievability of these standards. The Congressional review includes a study by the National Academy of Sciences, which is to report its findings by September 1974.

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* Appendix C summarizes the standards applicable to light duty motor vehicles.

The application of the statutory emission standards has been postponed for an additional year by the Energy Supply and Environmental Coordination Act of 1974. EPA has found that the statutory emission standards for HC and CO are required for NAAQS maintenance and are technologically feasible of attainment. EPA has also advised the Congress that in the near term (i.e., through 1989 model year) control of NO_x from passenger cars need not be so stringent as had been believed in 1970 since the national extent of NO_2 air pollution has been found to have been overstated.

Although not sufficiently stringent to eliminate the automobile as a significant source of air pollution in all cities, the achievement of the statutory standards will solve the auto air pollution problem in most places if within a decade all cars meet that standard when new and continue to meet the standard in use. Research is continuing to develop engine systems capable of even lower emissions than the statutory HC and CO standards, but there will have to be presently unforeseen breakthroughs before significant further emission reductions will be possible for gasoline-powered conventional internal combustion engines.

b. Enforcement

To assure that new car designs introduced into commerce are capable of meeting applicable emission standards, the Act (under Section 206) requires that prototypes of new motor vehicles or engines be tested (according to procedures set by the Administrator) for conformity with the applicable emission standards. To implement this provision of the Act, EPA has operated since the 1968 model year an activity known as the Certification Program. Before being allowed to sell a new car in the United States, a manufacturer must obtain a Certificate of Conformity from EPA. To obtain the Certificate of Conformity, the manufacturer must demonstrate, in accordance with detailed procedures that are spelled out in regulations, that the design of the cars proposed to be sold is capable of allowing the car to meet applicable emission standards. All cars of each type, when mass produced, must be "in all material respects the same as" the certified prototype. The underlying assumption is that if mass produced cars are materially the same as the prototype that demonstrated compliance with the standards, the cars in use should also meet standards.

To date, success in meeting emissions standards by all post-1968 cars on the road has been less than complete. Nevertheless, substantial reductions in emissions have been achieved. Surveillance data show that, while large numbers of cars exceed to some degree the applicable emissions standard, the mean emissions from controlled cars are far below the emission levels of earlier uncontrolled cars. For example, the following table summarizes the results of emissions tests on 1970 and 1971 in-use vehicles:

Table V. Actual Emissions Performance of In-Use 1970 and 1971 Model Year Automobiles

	Pollutant Emissions [a]		
	HC	CO	NO_x [b]
Uncontrolled Cars	8.74gm/m [c]	86.5gm/m	3.54gm/m
1970/71 Standards	4.1	34	no standard
1970 Model Cars [d]	3.9	48.2	5.05
1971 Model Cars	3.06	40.1	4.81

[a] In terms of the 1975 Federal Test Procedure.
[b] Note that in the absence of an NO_x standard, NO_x emissions increased.
[c] Grams per mile.
[d] Excluding cars tested at high altitude (Denver) which have substantially higher emissions but which represent less than 3% of all cars in U.S.

There are three possible reasons for the excess emissions measured from in-use cars: The mass-produced cars may not have been in all material respects the same as the certified prototypes, the in-use cars may not have been properly operated and maintained, and the certification process itself may be deficient in evaluating a car's design capability for meeting applicable standards. In all likelihood, a combination of all three reasons is operative.

Possible inadequacies in the certification process itself are in process of review. EPA is undertaking a comprehensive review of the whole certification program, with the objective of identifying opportunities for improving its effectiveness and/or reducing its cost.

In recognition of the problem of material sameness of mass-produced cars, the Act [under Section 206(b)] authorized end-of-assembly-line emissions testing to assure that cars as built meet the standards. Regulations for implementing this provision of the Act are in process of development within EPA. Production compliance audits, in addition to emissions testing, by EPA enforcement officers will continue to provide assurance that manufacturers are not intentionally manufacturing vehicles unlike the certified prototypes.

The regulations being considered within EPA for implementing the end-of-assembly-line testing authority of the Act would implement the Selective Enforcement Audit concept (SEA). SEA, like other assembly line testing concepts, is expected to result in increased attention being paid, on the part of the manufacturers, to the emissions performance of the vehicles that leave assembly plants. SEA, as currently conceived, would require the testing, using the Federal Test Procedure and pursuant to EPA orders, of samples of production vehicles from selected assembly plants.

In recognition of the problem of proper operation and maintenance of vehicles, the Act envisions the periodic testing of motor vehicles and the maintenance of vehicles failing emission tests. Responsibility for carrying out such programs belongs to the States in which such controls are needed to meet ambient air quality standards; the need for these controls is documented in the State Implementation Plans. Under Section 207(b), when there has been developed a practical short-test for use in periodic inspection programs, which test reasonably correlates with the full Federal certification tests, EPA is to issue regulations on the basis of which manufacturers are obligated to repair, without cost to the vehicle owner, any vehicle that has been properly operated and maintained and that nevertheless fails an in-use emission inspection test.* This provision of the law applies only to vehicles of model years produced after the promulgation of regulations requiring that manufacturers warrant vehicles against such failure.

Another potentially significant section of the Act is section 207(a), which requires manufacturers to provide, in effect, a materials and workmanship warranty that will provide that any failure of the vehicle to meet emissions standards due to defective materials or workmanship will be rectified without cost to the vehicle owner. Since difficult problems exist regarding the ability of consumers to establish and document valid warranty claims, EPA is developing a list of components which, if defective, may be presumed to be covered by the warranty.

Attending any significant degree of activation of the section 207(a) or (b) warranties are potential threats to the abilities of independent aftermarkets parts manufacturers and service establishments to compete against auto manufacturers who wish to condition the statutory warranties on use of original equipment manufacturer parts and dealer service. These issues are being addressed by EPA and the automotive industry, with hope of some resolution during fiscal year 1975.

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* Tests for use in inspection programs are available and are being used. The correlation between these tests (and their pass/fail points) and the test used to certify new vehicles has not been established.

c. Recall of In-use Vehicles

Section 207(c) of the Act allows EPA to require the recall and repair (at no cost to the vehicle owner) of classes or categories of vehicles of which substantial numbers are found to exceed applicable emission standards in spite of having been properly maintained and operated. To identify such non-conforming vehicles, EPA conducted an emission surveillance program for 1972 model year vehicles (the first model year to which this provision applies); on the basis of this program, manufacturers have been asked to provide data on certain high-emitting vehicle classes. A similar surveillance program for 1972, 1973, and 1974 model year vehicles has been initiated. EPA is also using data from other sources (e.g., commercial diagnostic centers, manufacturers' records, State emission inspection programs) to identify component failures or other factors that may lead to high emission rates for the purpose of assessing the need for recall. On this basis, two recalls have thus far been ordered, involving a total of more than 800,000 vehicles.

d. Control of Tampering with Emission Control Devices and of Non-Compliant Imports

Section 203(a)(3) of the Act prohibits tampering with emission controls by automobile manufacturers and dealers. States have to enact and enforce prohibitions against tampering by other persons, i.e., owners and independent service establishments. More than half the States have enacted such statutes, but their enforcement is not as vigorous as would be desirable. Definition of the tampering problem in terms of its scope and impact on air quality is currently proceeding.

EPA initiated, during the first 10 months of 1973, 28 investigations of consumer complaints of dealer tampering. Several such cases have been or will be referred to the Department of Justice for prosecution. One case, in Florida, has been completed; the dealer involved was convicted and fined on February 28, 1974. These investigations implement a facet of a policy of deterrence and guidance. An inspector's guidebook has been prepared and made available to the States for use in tampering control activities. A program of education and guidance in their use is conducted.

Congress amended the Clean Air Act in 1970 to expressly eliminate the importation, by any person, of vehicles not in compliance with the provisions of a Certificate of Conformity. EPA has taken appropriate steps to advise the general public of the import restrictions; working relations have been established with U.S. Customs at all major ports of entry. Although about 3 million vehicles and engines are imported each year, the major problems are associated with importation of approximately 15,000 non-complying vehicles by "gray market" commercial importers and by individuals, e.g., tourists and servicemen returning from foreign countries.

Any nonconforming vehicle imported must be re-exported or brought into conformity with standards (under EPA supervision) within 90 days of entry.

In 1975 and beyond, the need to monitor the entry of certified vehicles which have been delivered overseas will constitute a new area of activity. Nineteen seventy-five model year and later vehicles will be equipped with catalysts, requiring unleaded gasoline; such vehicles entering the Unites States after use in foreign countries, where lead-free gasoline may not be available, may require new catalysts.

3. Heavy-duty Vehicles

Since the 1970 model year, the engines that are installed in heavy-duty vehicles have also been subject to emission standards. In this case, because of the nature of the industry, the control is not on complete vehicles (as it is in the light-duty area) but on engines. These standards were made more stringent effective with the 1974 model year.

It is generally recognized, however, that the current emissions standards applicable to heavy-duty vehicle engines are comparatively less stringent than are the emission standards for light-duty vehicles. Problems standing in the way of imposing on heavy-duty vehicle engines emission standards of a severity comparable to, or at least approaching, the standards that apply to light-duty vehicles are related to the emission test procedure used. The emissions from heavy-duty vehicles cannot at this time be effectively related to the contribution to urban air pollution of such vehicles. The emission test procedure in use is probably adequate to characterize heavy-duty vehicle emissions during steady-state (i.e., highway) operation, but it does not adequately describe how heavy-duty vehicles operate in, and thus contribute pollution to, congested urban areas. Work is in progress to develop a meaningful heavy-duty vehicle test procedure, on the basis of which the air quality impact of heavy-duty vehicle emissions can be documented, and stringent standards justified.

It is also planned to split from the current heavy-duty class (which covers vehicles above 6,000 lbs. gross vehicle weight) those vehicles (possibly up to 10,000 lbs. GVW) that are more like light-duty vehicles in their design, operations, and control potential. Within the next year, it is expected that a medium-duty vehicle class will be established with emission standards less stringent than the standards for light-duty vehicles, but substantially more stringent than at present.

4. Motorcycles

Motorcycles, although subject to control under the Act, have until recently received limited attention. The combination of the stringent

light-duty statutory standards and the VMT restrictions contemplated for some AQCRs under transportation control plans have focused attention on motorcycles. For some AQCRs, due to the potential widespread shift to the use of motorcycles (which have significantly better fuel economy than automobiles), outlawing the sale or use of motorcycles has been proposed in case emissions standards are not applied to this class of mobile sources. An Advanced Notice of Proposed Rule Making on this subject was published on January 17, 1974. Emission standards for new motorcycles are expected to apply by the 1976 or 1977 model year.

5. Aircraft

Section 231 of the Act directed EPA to set emission standards for aircraft. Even though in the aggregate aircraft are a relatively minor source of urban air pollution, in the vicinity of major airports aircraft have been shown to be significant sources of HC, CO, and NO_x. Accordingly, EPA has set certain emission standards for aircraft. Fuel venting and smoke emissions are limited, effective January 1, 1974; sharp emission reductions on newly built aircraft engines go into effect in 1979, and even more stringent reductions for engines newly certified after 1981. EPA has proposed requiring the retrofit of existing engines to the 1979 standards, beginning in 1979.

Emission standards to apply to supersonic aircraft were proposed in July, 1974. Much work needs to be done to improve emission measurement techniques for aircraft engines, and to continually assess the status of and progress of technology being developed to meet the 1979 and 1981 standards.

D. Fuel and Fuel Additives

1. Introduction

Section 211 of the Act provides for the registration and control of fuels and fuel additives. Regulations for the control of the content of lead and phosphorus in gasoline have been promulgated, requiring that lead-free gasoline (defined as containing no more than 0.05 grams of lead per gallon and no more than 0.005 grams of phosphorus per gallon) be generally available by July 1, 1974,* and requiring a phased reduction of the lead content of all gasoline.**

On March 7, 1974, regulations for the registration of fuels and fuel additives were proposed by EPA. These proposed regulations would supercede those in effect since June 13, 1970. The purpose of the regulations would be to establish procedures for obtaining basic information about fuels and their additives in order to determine the effects

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* Federal Register v. 38, No. 6, 1/10/73, pp. 1254-56; 38 FR 1254
**Federal Register v. 38, No. 234, 12/6/73; 38 FR 33738.

which they, or their combustion products, may have on emission control devices (e.g., catalytic converters) or on the public health and welfare. Control of specific motor vehicle fuels or fuel additives may be implemented as a result of this information or other information available to the Administrator. The proposed regulations would prohibit the sale or introduction into commerce of fuels or additives, designated by the Administrator, after specified dates: Within six months after promulgation of the regulations, fuel additives for addition to motor vehicle gasoline, motor vehicle diesel fuel, and/or motor vehicle crankcase oil would have to be registered; within eight and twelve months, motor vehicle gasolines and Diesel fuel would have to be registered, respectively. Additional fuels and additives may be designated at a later date.

2. Control of Lead

a. Protection for Motor Vehicle Emission Control Devices

Lead and phosphorus additives in gasoline quickly lead to the disablement of catalysts. Catalysts will be used in significant numbers for the control of CO and HC emissions in 1975 and later model year light duty motor vehicles. It has been determined that catalysts require gasoline with an average lead content of 0.03 grams per gallon or less; the regulation setting the maximum permissible level at 0.05 grams of lead per gallon of gasoline is expected to result in the marketing of gasoline with an average lead content of 0.03 grams per gallon.

b. Protection of Health and Environment from the Effects of Lead

The phased reduction of lead content of all gasolines is required for the protection of public health and welfare. The issue concerning the contribution of lead exhausted from automobiles to the country's lead exposure problem is complex and controversial. EPA has concluded that there is a health basis for reducing the use of lead in gasoline.

A small but significant portion of the urban adult population and up to 25% of children in urban areas are over-exposed to lead. The lead exposure problem is caused by a combination of sources including food, water, air, leaded paint, and dust; their aggregate contribution of lead poses a significant threat to health. However, it is extremely difficult to determine each separate environmental factor's contribution. Since these are cumulative sources, whose importance varies considerably among individuals, it is likewise difficult to determine what impact would be achieved by partial or total reduction of lead from any one source. Should the lead in all sources be reduced, however, the danger of exposure would be substantially reduced.

Leaded gasoline is one of the few sources not yet subject to any controls, although it accounts for approximately 90% of airborne lead.

Human exposure to this lead takes place by inhalation and by ingestion of dirt and dust contaminated by airborne lead fallout. Since increased exposure to lead among the general population is widespread, it is reasonable to reduce preventable sources of lead exposure including lead emissions resulting from lead in gasoline. Furthermore, because leaded gasoline is a major cause of the unnatural amounts of lead in the envionment, a reduction in the lead content of gasoline would decrease environmental lead contamination.

c. Applicability of the Regulations

The regulations provide for certain procedures and actions that must be followed by refiners, retailers, auto manufacturers, and additive manufacturers to assure that lead content of gasoline is phased down, that there is available lead-free fuel, and that other-than-lead-free fuel is not introduced into motor vehicles that require lead-free fuel. Violations of the regulations are punishable by fines of up to $10,000 for each and every day of violation.

A schedule for lead reduction is set, as follows:

Date	Lead Content (grams per gallon)*
January 1, 1975	1.7
January 1, 1976	1.4
January 1, 1977	1.0
January 1, 1978	0.8
January 1, 1979	0.5

Refiners and lead additive manufacturers are required (commencing with the first quarter of 1975) to submit reports to EPA that will allow EPA to assess compliance with the regulations. Analysis of the data reported to EPA will provide the primary basis for assuring compliance with the regulations on the phase-down of gasoline lead content. Action will be taken to assure accuracy of reporting.

After July 1, 1974, gasoline distributors are prohibited from selling gasoline represented as unleaded gasoline that does not meet the requirements for unleaded gasoline, and retailers are required to install appropriate labeling to assure proper identification of leaded and unleaded gasoline dispensing pumps, equip pumps with appropriate nozzle spouts

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* Average for each calendar quarter. Refiners with less than 30,000 barrels per day crude oil capacity are exempted from the application of this schedule until January 1, 1977.

according to the type of gasoline dispensed, and offer for sale at least one grade of unleaded gasoline in all retail outlets with sales of 200,000 or more gallons per calendar year for any year beginning with 1971.

To complement these safeguards, auto manufacturers are required to prominently label vehicles requiring unleaded fuel and to manufacture vehicles with gasoline tank filler inlets compatible with the nozzle spout for the appropriate fuel requirement; their compliance will be assured through the process of certification of prototypes and through production compliance audits.

Approximately 111,000 retail outlets are affected by the requirement to provide lead-free gasoline. This requirement will provide general accessibility to unleaded fuel in cities and all counties except those most sparsely populated. Regulations proposed on May 7, 1974 are aimed at increasing the coverage in low population density counties. The proposed regulations would require that retail outlets located in a county containing a population density less than 50 persons per square mile and that sold at least 150,000 gallons of gasoline in 1971 or later, offer unleaded gasoline. The calculation of county density excludes cities with populations equal to or greater than 50,000 persons. It is expected that the proposed regulations would increase the number of gas stations with lead-free gasoline by 10,000.

It is highly probably that manufacturers will not willfully violate the requirement to manufacture gasoline that meets unleaded gasoline specifications. The only significant potential for violation of the lead content regulations for unleaded gasoline resides in contamination. Contamination of unleaded gasoline from lead contained in other types of gasoline at any point in the distribution channel extending from the refiner through the distributor to the retailer must be guarded against. Prevention of such contamination is entirely within these establishments' control if sufficient resources are dedicated to prevent contamination.

It is EPA strategy to present a sufficiently high risk associated with non-compliance, i.e., risking being "caught" and heavily fined, to assure that these resources are applied to the task by the affected parties. EPA Regional Office enforcement activities will provide surveillace over unleaded gasoline by use of mobile sampling laboratories. In keeping with EPA policy, State assumption of responsibilities for assuring the general availability of lead-free gasoline is to be encouraged.

V. Federal Support of State and Local Activities

Historically, control agency support has been provided to stimulate air pollution control agency development and growth and to encourage a systematized approach to the prevention and control of air pollution on a regional, State, and local basis. Implementing the philosophy of the Clean Air Act, which emphasizes the importance of the State and local role, support mechanisms are geared to alleviating the need for Federal enforcement of the State Implementation Plans by assisting in obtaining resources for and providing technical assistance to State and local agencies.

Federal grant support to control agencies grew from approximately $4.2 million in 1965 to $51.5 million in 1973. The contribution of non-Federal funds made by State and local governments over the same time span has ranged from approximately $11.6 million in 1965 to $64 million in 1973. Federal support has remained at a constant level of approximately $51.5 million of each of the last two fiscal years and is expected to be at the same level for fiscal year 1975.

The resource estimates contained in the original SIP submissions indicated that State and local control agencies would have to expand their activities to a level of approximately $144 million and 8,600 man years of effort in 1975 (and for every year thereafter) to meet statutory deadlines. However, a number of new requirements made of these agencies because of court interpretations of the Act's requirements or further clarification of the SIPs, have led to recent estimates indicating approximately 9,500 man years will be needed by these agencies in 1975. Currently, there are approximately 5,700 man years devoted to air pollution control in States and local agencies. The potential shortfall in resources, coupled with the nearness of mandatory deadlines, make necessary the emphasis of "targeting" funds toward the highest priority objectives.

In order to implement this policy, the control agency support funds allocation emphasis has been shifted from the historical functional concept of building control programs at the State and local level to the concept of supporting the preparation and revision of State Implementation Plans and the performance of activities essential to the attainment of the objectives of the Plans. Furthermore, the emphasis has shifted to priority geographical areas. This was reflected in the final allocation of funds for this program in FY 1974, which emphasized support of those agencies having primary responsibilities under the SIPs. This concept will be continued for FY 1975, with the following refinements: (a) Definition of and commitment to the attainment of management objectives (outputs) which will lead to the accomplishment of the primary EPA goals in this area (i.e., the attainment of the primary NAAQS in all AQCRs by the end of FY 1975 or, in some cases, 1977); (b) a resources allocation which will emphasize the highest priority air outputs in geographic areas where increased resources are needed to attain

the NAAQS, particularly where expanded State and local enforcement activities are required; (c) assessment and evaluation of State and local agencies based on performance in meeting objectives; and (d) implementation of funding decisions, based upon the assessment of these factors.

The grants mechanism involves the issuance of a planning figure to the EPA Regional Offices, along with annual guidance regarding agency, and hence grant, priorities. The Regional Offices then obtain estimates of commitment, from State/local agencies, based on the planning figure, agency needs, and commitments to outputs and priorities as described above. These estimates are submitted, along with estimates of shortfalls in accomplishment, if any, to EPA Headquarters. The final allocation to the Regional Offices will then reflect an evaluation of these commitment figures, the level of funds available, and agency program priorities. The Regional Offices will, in turn, determine individual grants based upon these output commitments and evaluation of individual grantee capability.

Also available is support in the form of basic ordering agreements funded by EPA (BOA contracts), EPA Regional Office technical assistance, various types of personnel assignments, and training and training aids. Priorities for these types of support reflect those used in determination of grant support and should be complementary to and coordinated with such support. Skills are an important resource and the need for training should be examined along with the needs for other assistance.

Generally, in FY 1975, EPA is concentrating on: (1) Direct source control by State and local agencies through compliance schedules in Air Quality Control Regions where the National Ambient Air Quality Standards currently are being violated; (2) selective direct enforcement activities by EPA (on a priority basis), where needed to foster or augment State and local activities; (3) completion and performance of high priority SIP revisions (transportation control plans, indirect source control, and prevention of significant deterioration of air quality measures); (4) monitoring, collection and reporting of air quality and emissions data; and (5) acceptance of and action on delegable Federal authorities (i.e., NSPS, NESHAP) by the States. The cessation or reduction of Federal support to control agencies which do not have significant responsibilities in the performance of these highest priority activities will continue. EPA does, however, acknowledge the importance of non-Federally mandated functions, such as odor and nuisance controls, and encourages continuing local and State support of these activities.

Finally, the EPA Regional Offices, in addition to negotiating outputs and relating grants to priority commitments, track accomplishments and perform program evaluations. Generally, these program reviews cover the following areas of activity:

(1) Enforcement: The grantee should be getting the major stationary

sources of air pollution on compliance schedules and carrying out adequate surveillance and, where appropriate, taking an adequate role in the implementation of transportation control plans.

(2) Source Emission Analysis: The grantee should be able to obtain and verify emissions data from sources, and should have the capability to assess the impact of individual sources on air quality.

(3) Monitoring: Each State should meet the minimum EPA monitoring requirements (as set out in regulations) and that such data are collected and reported in compliance with Federal reporting requirements. Funding of overly extensive or duplicative monitoring systems should be especially avoided.

(4) Long-Term Maintenance of Desirable Air Quality: The States should have submitted SIP revisions on maintenance of standards, and, when due, prevention of significant deterioration. In developing these plan revisions, States must work closely with local air pollution control and land use and transportation agencies, as well as State planning and transportation agencies. Agencies with responsibility for these areas of the SIPs should have the capability to analyze indirect and stationary sources of air pollution and should adequately enforce development controls and land use practices which will maintain and preserve air quality.

(5) EPA Delegations: The Regions should obtain commitments from the States for acceptance of delegations of the New Source Performance Standards and the National Emissions Standards for Hazardous Air Pollutants (NESHAP) and assure that the agencies which have responsibility for these are adequately carrying them out.

It should be noted that revised air grants regulations (which were published on February 28, 1974, as interim regulations*) provide that a Region may reduce a grant where the grantee has failed to produce an output or to assume responsibility for a Federal delegation and where, as a result, Federal intervention is necessary. The Regional Offices will utilize this authority in order to prevent the duplication of Federal resource efforts which would result from Federal intervention and continuation of grant support. The revised regulations also require that there be clearly stated agreements between State and local agencies (where there are local agencies) as to the respective roles of the agencies. Regional Offices should use this provision to help foster coordination of programs and to help eliminate duplication and oversight.

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* 39 CFR 77.

Appendix A

List of Abbreviations, Symbols, and Acronyms

AQCRs	Air Quality Control Regions
AQMA	Air Quality Maintenance Area
AQMP	Air Quality Maintenance Plan
BOAs	Basic Ordering Agreements
CFP	Clean Fuels Policy
CO	Carbon monoxide
EPA	(U.S.) Environmental Protection Agency
FGD	Flue gas desulfurization
FMVCP	Federal Motor Vehicle Control Program
FY	Fiscal year
GVW	Gross vehicle weight
gm/m	Grams per mile
HC	Hydrocarbons
HQ	Headquarters (EPA)
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standard for Hazardous Air Pollutants
NO_x	Nitrogen oxides
NO_2	Nitrogen dioxide
NSPS	New Source Performance Standards
O_x	Total oxidants

SCS	Supplementary Control Systems
SIPs	State Implementation Plans
SMSA	Standard Metropolitan Statistical Area
SO_x	Sulfur oxides
SO_2	Sulfur dioxide
TCPs	Transportation Control Plans
TSP	Total suspended particulates
VMT	Vehicle Miles Traveled
$\mu g/m^3$	Micrograms per cubic meter

APPENDIX B

National Ambient Air Quality Standards [a]

Pollutant	Averaging time	Primary [b] standards	Secondary [c] standards
Particulate matter [d]	Annual (Geometric mean)	75 $\mu g/m^3$	60 $\mu g/m^3$
	24-hour	260 $\mu g/m^3$	150 $\mu g/m^3$
Sulfur dioxide	Annual (Arithmetic mean)	80 $\mu g/m^3$ (0.03 ppm)	---
	24-hour	365 $\mu g/m^3$ (0.14 ppm)	---
	3-hour	---	1300 $\mu g/m^3$ (0.5 ppm)
Carbon monoxide	8-hour	10 mg/m^3 (9 ppm)	Same as primary
	1-hour	40 mg/m^3 (35 ppm)	
Photochemical oxidants [e]	1-hour	160 $\mu g/m^3$ (0.08 ppm)	Same as primary
Hydrocarbons [f] (nonmethane)	3-hour (6 to 9 a.m.)	160 $\mu g/m^3$ (0.24 ppm)	Same as primary
Nitrogen dioxide [g]	Annual (Arithmetic mean)	100 $\mu g/m^3$ (0.05 ppm)	Same as primary

[a] All standards are specified as not to be exceeded more than once per year. The measurement methods are also specified as Federal Reference Methods. The air quality standards and a description of the reference methods were published on April 30, 1971 in 42 CFR 410, recodified to 40 CFR 50 on November 25, 1972.

[b] Set for the protection of health.

[c] Set for the protection of welfare, which, in the words of the Act "includes, but is not limited to, effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well being." (Section 302 (b).)

[d] The secondary annual standard (60 $\mu g/m^3$) is a guide to be used in assessing implementation plans to achieve the 24-hour secondary standard.

[e] Expressed as ozone by the Federal Reference Method.

[f] This NAAQS is for use as a guide in devising implementation plans to achieve oxidant standards.

[g] No Federal Reference Method currently in effect.

APPENDIX C

Light Duty Motor Vehicle Exhaust Emission Standards

Model Year	Test	Standards, gm/mile HC	CO	NO_x
1970	7-mode	2.2	23	---
1971	"	2.2	23	---
1972	CVS-C*	3.4	39	---
1973	"	3.4	39	3.0
1974	"	3.4	39	3.0
1975 National	CVS-CH**	1.5	15	3.1
1975 Calif.	"	0.9	9	2.0
1976		Same as 1975.		
1977***		0.41	3.4	2.0
1978		0.41	3.4	0.40

*CVS-C = Constant Volume Sampling with a cold start.

**CVS-CH = Constant Volume Sampling with cold and hot starts.

***After January 1, 1975, manufacturers may apply for a one-year suspension of the application of these standards for HC and CO.

Appendix D

Summary Listing of Significant Regulations Promulgated by EPA in Implementing the Clean Air Act

The Code of Federal Regulations, Title 40, Subchapter C contains the most significant regulations that implement the Clean Air Act's requirements. Subchapter C -- Air Programs consists of the following parts:

Part	Title
50	National primary and secondary ambient air quality standards.
51	Requirements for preparation, adoption, and submittal of implementation plans.
52	Approval and promulgation of implementation plans.
53	Ambient air monitoring equivalent and reference methods.
54	Prior notice of citizen suits.
60	Standards of performance for new stationary sources.
61	National emission standards for hazardous air pollutants.
76	Prevention, control, and abatement of air pollution from Federal Government activities: performance standards and techniques of measurement.
79	Registration of fuel additives.
80	Regulation of fuels and fuel additives.
81	Air quality control regions, criteria, and control techniques.
85	Control of air pollution form new motor vehicles and new motor vehicle engines.

This appendix lists only those original regulations or changes that are deemed to be of significance in relation to the issues treated in this paper. The listing is not comprehensive. Regulations with a specialized or narrow application are excluded, e.g., emissions standards and testing procedures for motor vehicles. Likewise, SIP approval actions (part 52) are not listed due to their bulk.

Part	Date and Federal Register Reference	Regulations and Significance
50	1/30/71, 36FR1502	Notice of proposed national primary and secondary ambient air quality standards and list of air pollutants.
	4/30/71, 36FR8186	Final NAAQS were set by this regulation.
	5/7/73, 38FR11355	Proposed secondary SO_2 NAAQS change.

Part	Date and Federal Register Reference	Regulations and Significance
50 (cont.)	9/14/73, 38FR25678	The secondary NAAQS for SO_2 was limited to a single level, i.e., 3-hour average, by this action.
51	4/7/71, 36FR6680	Proposed requirements to be met by States for preparation, adoption, and submittal of implementation plans.
	8/14/71, 36FR15486	Final SIP requirements.
	1/12/73, 38FR1464	Proposed requirements for preparation and adoption of transportation control plans.
	6/8/73, 38FR15194	Final requirements for transportation control plans submission by States.
	4/18/73, 38FR9599	Proposed air quality maintenance and indirect source control regulations
	6/18/73, 38FR15834	Final regulations requiring SIP changes for the control of indirect sources and the maintenance of air quality.
	8/3/73, 38FR20832	Requirements for submission of quarterly reports on air quality and semiannual reports on emissions and progress.
	9/14/73, 38FR25697	Proposed regulations on the use of supplementary control systems and implementation of secondary standards.
60	8/17/71, 36FR15704	Proposed NSPS for Group I industries.
	12/23/71, 36FR24876	Final Group I NSPS.
	3/21/72, 37FR5767	Supplemental statement explaining the basis for the Group I NSPS.
	6/11/73, 38FR15406	Proposed NSPS for Group II industries.
	3/8/74, 39FR9308	Final Group II NSPS
61	3/31/71,	Listing of asbestos, beryllium, and mercury as hazardous pollutants.

Part	Date and Federal Register Reference	Regulations and Significance
61 (cont.)	12/7/71, 36FR23239	Proposed NESHAP for pollutants listed on 3/31/71.
	4/6/73, 38FR8820	Final NESHAP for asbestos, beryllium, and mercury.

Appendix E

List of Air Quality Maintenance Areas

State	City/Area *
Alabama	Birmingham, Gadsden, and Mobile.
Alaska	None.
Arizona	Phoenix.
Arkansas	Little Rock and Fort Smith.
California	Monterey County, Sacramento Valley Area, San Diego County, San Francisco Bay Area, San Joaquin Valley, South Coast Air Basin (Los Angeles, Orange, Riverside, San Bernardino, Santa Barbarba, Ventura Counties), and Southern Desert Area (Cochella Valley portion of Riverside County).
Colorado	State Planning & Management Districts -- No. 2, Larimer and Weld Counties; No. 3, Adams Arapahoe, Boulder, Clear Creek, Denver, Douglas, Gilpin and Jefferson Counties; No. 4, El Paso County; No. 7, Pueblo County; and No. 11, Garfield, Mesa and Rio Blanco Counties.
Connecticut	The total Connecticut portions of the New York-New Jersey, and Hartford-New Haven-Springfield Interstate Air Quality Control Regions.
Delaware	None.
District of Columbia	The District of Columbia.
Florida	Fort Lauderdale-Hollywood, Gainesville, Jacksonville-Lakeland-Winter Haven, Melbourne-Titusville-Cocoa, Miami, Orlando, Pensacola, Tallahassee, Tampa-St. Petersburg.
Georgia	Atlanta, Savannah, and Chattanooga Interstate (Georgia portion, i.e., Catoosa and Walker Counties).

* Cities usually include the surrounding county or metropolitan area. All areas have been preposed; no final designation action taken as of this writing (August 1974).

List of Air Quality Maintenance Areas (continued)

State	City/Area
Hawaii	Honolulu.
Idaho	None.
Illinois	Chicago Interstate, Decatur, Peoria, Rock Island, St. Louis Interstate, and Springfield.
Indiana	Anderson, Cincinnati Interstate, Evansville, Chicago Interstate, Indianapolis, Lafayette, Louisville Interstate, South Bend, and Terre Haute.
Iowa	Cedar Rapids, Council Bluffs, Davenport, Des Moines, Dubuque, and Waterloo.
Kansas	None.
Kentucky	Louisville.
Louisiana	Baton Rouge, New Orleans, and Shreveport.
Maine	None.
Maryland	Baltimore, National Capital Area (Maryland portion, i.e., Montgomery and Prince Georges Counties); Potomac River Basin (Allegheny and Garrett Counties, Cumberland City, and Hagerstown City).
Massachusetts	Boston, Springfield, Worcester, and Lawrence-Haverhill.
Michigan	Ann Arbor, Battle Creek, Bay City, Detroit, Flint, Grand Rapids, Lansing, Monroe, and Saginaw.
Minnesota	Minneapolis-St. Paul and Duluth.
Mississippi	None.
Missouri	St. Louis.
Montana	Billings, Great Falls, Butte, Anaconda, Helena, Kalispell, Missoula, and Coal Area (Bighorn, Powder River and Rosebud Counties).
Nebraska	None.

List of Air Quality Maintenance Areas (continued)

State	City/Area
Nevada	Las Vegas.
New Hampshire	None.
New Jersey	Allentown-Bethlehem-Easton (Pennsylvania - New Jersey), Jersey City, Long Branch-Asbury Park, New Brunswick-Perth Amboy-Sayreville, Newark, Morris, Bergen, Passaic, Philadelphia (Pennsylvania - New Jersey), Trenton, and Salem.
New Mexico	Albuquerque, Four Corners, Grant County, Las Cruces, Roswell, and Santa Fe.
New York	Binghamton, New York City Metropolitan Area, Niagara Frontier (Erie and Niagara Counties), Utica-Rome, Elmira-Corning, Rochester, Jamestown, Syracuse, Capital District (parts of Albany, Montgomery, Rensselaer, Saratoga and Schenectady Counties), and Mid-Hudson Area (Parts of Dutchess County, all of Orange and Putnam Counties, and parts of Ulster County).
North Carolina	Asheville, Charlotte-Gastonia, Greensboro, Raleigh-Durham, and Winston-Salem.
North Dakota	Cass and McLean-Mercer-Oliver.
Ohio	Akron, Canton, Cincinnati Interstate, Cleveland, Columbus, Dayton, Hamilton-Middletown, Lorain, Mansfield, Springfield, Steubenville, Toledo and Youngstown.
Oklahoma	Central Oklahoma (Oklahoma County and parts of Canadian and Cleveland Counties), and Tulsa.
Oregon	Portland-Vancouver, Eugene-Springfield, and Medford-Ashland.
Pennsylvania	Allegheny County, Allentown-Bethlehem-Easton, Beaver Valley Air Basin (portions of Lawrence and Beaver Counties), Erie Air Basin (a portion of Erie County), Harrisburg Air Basin (portions of Cumberland and Dauphin Counties), Johnstown Air Basin (a portion of Cambria County), Lancaster Air

List of Air Quality Maintenance Areas (continued)

State	City/Area
Pennsylvania (continued)	Basin (a portion of Lancaster County), Monongahela Valley Air Basin (portions of Washington, Fayette and Westmoreland Counties), Reading Air Basin (a portion of Berks County), Southeast Pennsylvania Air Basin (Bucks, Chester, Delaware, Montgomery and Philadelphia Counties), Scanton-Wilkes-Barre Air Basin (portions of Luzerne and Lackawanna Counties), and York Air Basin (a portion of York County).
Rhode Island	Metropolitan Providence.
South Carolina	Charleston and Greenville.
South Dakota	Sioux Falls.
Tennessee	Chattanooga Interstate (Tennessee portion), Kingsport-Bristol, Memphis, and Nashville.
Texas	Beaumont, Corpus-Christi, Dallas-Fort Worth, Houston-Galveston, El Paso, San Antonio, and Austin.
Utah	Salt Lake City, Provo, Uintah Area (Duchesne and Uintah Counties), Southern Utah Area (Carbon, Emery, Garfield and Wayne Counties).
Vermont	None.
Virginia	National Capital Area (Virginia portion) Richmond, Petersburg-Colonial Heights-Hopewell, Lynchburg, Hampton-Newport News, Norfolk-Portsmouth-Virginia Beach, Roanoke.
Washington	Puget Sound, Spokane, and Portland-Vancouver.
Wisconsin	Southeast Wisconsin and Lake Michigan Sub-region.
West Virginia	None.
Wyoming:	Sweetwater County, Powder Riber Basin (Cambell, Johnson, Sheridan and Converse Counties).
Guam	None.
Puerto Rico	Ponce, San Juan, Guayanilla, and Penuelas.

List of Air Quality Maintenance Areas (continued)

State	City/Area
U.S. Virgin Islands	None.
American Samoa	None.